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Ancient Egyptian Chronology

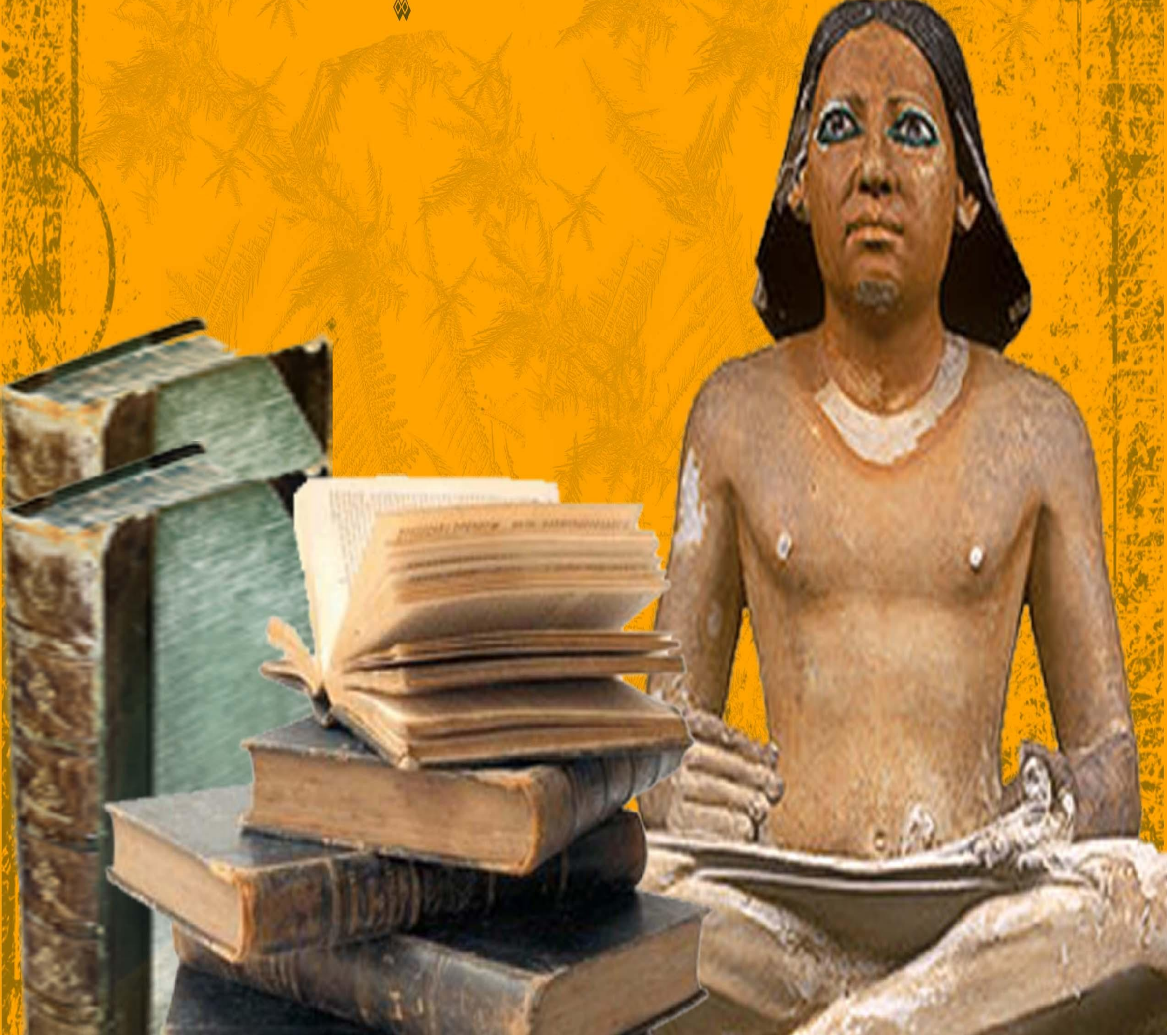
Edited by

Erik Hornung,
Rolf Krauss, and
David A. Warburton

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Ancient Egyptian Chronology

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SECTION ONE

THE NEAR AND MIDDLE EAST

VOLUME EIGHTY-THREE

Ancient Egyptian Chronology

Edited by

Erik Hornung, Rolf Krauss, and David A. Warburton

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EDITORIAL

With this volume of the Handbook of Oriental Studies (Handbuch der Orientalistik) a new editorial board for the ancient Near East takes over from the board that has edited the HdO volumes for so many years. The new editors have been chosen because of their expertise in the fields that pursue the study of the civilizations of the ancient Near East. These editors are: G. Beckman (Hittitology), C. Leitz (Egyptology), B. Levine (Hebrew Bible/Ancient Israel), P. Michalowski (Sumerology), P. Miglus (Near Eastern Archaeology), and W. H. van Soldt (Assyriology, Editor-in-Chief).

The board has planned a number of new volumes in the HdO series and expresses the hope that with these volumes the series will resume its original function of a handbook for Ancient Near Eastern Studies. At the same time, the new board is committed to the publication of volumes that had already been planned and accepted and which are scheduled to appear in the near future. However, it should be pointed out that the present board members do not necessarily agree with the entire content of a volume that they have 'inherited' from their predecessors.

Finally, we would like to thank the members of the former editorial board for all their work for the HdO series.

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ACKNOWLEDGMENTS

It was Wolfgang Schenkel who suggested the project of a *Handbook of Egyptian Chronology* to Brill, Academic Publishers, nearly a decade ago. He will have asked himself in the intervening years whether the work would ever appear.

Co-editor Erik Hornung developed the concept of the Handbook and together we selected the authors for each section. The subsequent addition of David Alan Warburton to the team provided an impetus to overcome the inertia that had set in. He and Marianne Eaton-Krauss took over the thankless task of translating and/or editing contributions by authors whose mother tongue was not English, except for Chapters II. 1 and 11, III. 7, 9, and 11.

I am indebted to the Stiftung Preussischer Kulturbesitz who transferred me from the Ägyptisches Museum to the Museum für Vor- und Frühgeschichte in 2001 to do research on the Calendrics and Chronology of ancient Egypt, the Near East and Europe. Although the move deprived me of direct access to an Egyptological library, the *Handbook* would not have seen the light of the day without this change of fortune. Thanks to Wilfried Menghin, Director of the MVF, I could concentrate on the *Handbook* during 2004 and 2005.

Last but not least, I thank Juán José Granados who encouraged me to complete the unloved task.

R.K. February 2006

INTRODUCTION

Erik Hornung

It is widely accepted that chronology is the "spine" of history. The ensuing image is slightly distorted since one can only extend or shorten a spine using violence, stretching it or forcing it like the giant Procrustes into a bed which is far too short. In recent years there have been repeated attempts to cut an entire century off history, and not merely in the "Dark Ages" of antiquity, but even now for the supposedly "invented" Middle Ages. It would thus be more suitable to view time as the clothing of history: a garment can be non-violently adjusted to a changing body. The image of time as a piece of clothing, the habit of mankind and the dress of the deity, can be found in the poem "Song of Time" by the Pakistani poet Muhammad Iqbal (1877–1938),[1] who was doubtless inspired by Goethe's expression, "the living dress of the divinity" created by the spirit of the Earth "on the whirring loom of time" (Faustus, verses 508f.).

But, first a word on the temporal horizon of the Egyptians.[2] Even ʿAnkhtifi of Moʿalla looked hopefully to a future of "millions of years", during which no one would approach his deeds.[3] Indeed, before the end of the FIP, these "millions of years" rapidly became a commonplace (being known from a wish for King Merykareʿ in Asyut),[4] ultimately becoming a synonym of the twin temporal concepts *neheh* and *djet*. This is most clearly expressed in the representation of the Dyn. 21 illustrated papyrus of Khonsumes in Vienna, where all three stand together, raised on yokes and thus divine,[5] subordinated to the solar

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[1] In A. Schimmel, ed., *Botschaft des Ostens* (Tübingen & Basel, 1977), 149.

[2] E. Hornung, "Zeitliches Jenseits im alten Ägypten", *Eranos-Jahrbuch* 47 (1978), 269–307, esp. 297–298.

[3] Schenkel, *Memphis*, 47.

[4] F. Ll. Griffith, *The Inscriptions of Siût and Dêr Rîfeh* (London, 1889), pl. 13, IV 22. In Dyn. 6, Pepy II was wished "millions of *sed*-festivals" (*Urk.* I, 115, 1).

[5] H. von Demel, "Der Totenpapyrus des Chonsu-Mes", *Jahrbuch der Kunsthistorischen Sammlungen in Wien*, N.S. 13 (1944), 1–16; A. Piankoff & N. Rambova, *Mythological Papyri* (New York: BS XL, 1957), no. 16; *djet* does not appear as a divinity, but rather formless, expressed in hieroglyphic writing.

orbit which constantly regenerates time while the sun itself is in the tow of the hours: solar circuit and time are thus indivisibly woven together. The memorial temples of the NK Pharaohs are thus "Houses of Millions of Years" as they guarantee the mortuary cult for the rest of the horizon of time[6] just as the tomb is the place of "the fullness of time (*neheh*)."[7] The limited individual stream of life flows into this sea of the "millions of years", as Pharaoh ends his in "millions of *sed*-festivals" in a specifically royal unit of time. In typical moderation, Akhenaten wishes to be buried in the new residence Akhetaten "after the millions of sed festivals which my father Aten has envisioned for me", while Nefertiti and the princess Meritaten are to be buried "after millions of years".[8]

In the Ramesside era, the horizon of the future grows even further, to "millions of millions of years", and thus exceeding our own astronomical temporal horizons.[9] The *Inscription Dédicatoire* in Abydos expresses the Ramesside spirit: in wishing Ramesses II "millions more of years than the lifetime of Re in heaven",[10] it thus exceeds the temporal dimensions of the cosmos itself. The Egyptians probably had the feeling that there was immeasurable time in the Beyond which was yet not beyond the bounds of time. The dead do not belong to eternity, but to the fullness of time benefiting from a new lifetime with every nightly passage of the sun-god. In the Beyond, however, all past time is accumulated in the "Place of Annihilation" (*hetemit*): it is there that the hours fall when they have passed, when they are "swallowed" by the time which "gave birth" to them.

The greatest possible extreme appears in the post scriptum to *Book of the Dead*, chapter 62, promising the deceased (in the role of the sun-god Re!): "The fullness of time (*neheh*) without limits is given to me, for I am the heir of *Neheh* to whom *djet* is given". One immediately

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[6] Cf. M. Ullmann, *König für die Ewigkeit—Die Häuser der Millionen von Jahren: eine Untersuchung zu Königskult und Tempeltypologie in Ägypten* (Wiesbaden: ÄAT 51, 2002).

[7] References in P. Vernus, "La stèle C 3 du Louvre", *RdE* 25 (1973), 217–234, esp. 223–224 (i), also the occasional designation of the Necropolis. The tomb can also be the "Horizon" of *neheh*, cf. F.-J. Schmitz, *Amenophis I.* (Hildesheim: HÄB 6, 1978), 213–214.

[8] Murnane & Van Siclen, *Stelae*, 25, 41.

[9] The statue of Bakenkhons in Munich, *KRI* III, 298; Hymn in P. Berlin 3049: J. Assmann, *Ägyptische Hymnen und Gebete* (Zurich & Munich, 1975), 127 B. A first time on the Cairo stele CG 34025 of Amenhotep III: *Urk.* IV, 1653, 16.

[10] *Inscription Dédicatoire*, line 27 = 31; *KRI* II, 325, 7–8; cf. U. Luft, *Beiträge zur Historisierung der Götterwelt* (Budapest: SA 4, 1978), 173.

recalls the dialogue of the Beyond in chapter 175 where Osiris asks Atum about the lifetime in the Beyond and is giving the comforting assurance that it is "millions of millions of years".

This concerns the future. As far as the horizon of the past is concerned, the Royal Canon of Turin[11] gives totals for the dynasties of the gods and demi-gods ("The Followers of Horus") before Menes and the beginning of the Dynastic Period which take us to nearly 37,000 years. The Early Dynastic kings are assigned long reigns, totalling almost another 1000 years up to Izezi, so that the Egyptians of the NK could look back towards a temporal horizon of nearly 40,000 years since the start of the world. That is a great deal when compared with the figures in the Christian and Jewish traditions. This matches statements made by the ancient authors. Herodotus (2, 142) reports that the Egyptian priests accounted for a human line of ancestors of 341 generations, which he reckoned amounted to 11,340 years before which lay the age of the gods. Greek historians, such as Hekataios of Abdera already reached the gods in the 16th generation. Genealogies as long as those given by Herodotus are generally encountered in the LP, the best known being the family tree of Memphite priests of Dyn. 22 which includes more than 60 generations.[12] In another note, Herodotus (2, 145) dates Hercules 900 years before his own day, and Dionysos "some 1000 years".

Our principal witness for the ancient Egyptian chronology is Manetho, and he must likewise have had similarly high numbers which were then forced into a truly Procrustean bed by the Christian authors who thus made it compatible with the Biblical chronology whose priority could not be doubted. At the same time, however, some individual items were systematically extended in order to achieve accord (particularly for the period between Menes and Adam), or in order to make the Egyptian past appear older.[13] Even in pre-Christian times, there were efforts to claim a chronological precedence for Greece at the expense of Egypt. Eudoxus of Cnidus (d. 356 BC in Egypt) opposed Herodotus' figures using the trick of transforming years into months.[14] From Manetho,

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[11] Gardiner, *Canon*; *KRI* II, 827–844.

[12] Berlin 23673: Borchardt, *Mittel*, 96–100; a good illustration of the document will be found in the catalogue A. Grimm, S. Schoske, D. Wildung, *Pharao: Kunst und Herrschaft im alten Ägypten* (Munich, 1997), no. 89. l.

[13] Cf. primarily Helck, *Manetho*, 76, 83; cf. also Krauss, *Amarnazeit*, 239 and Beckerath, *Chronologie*, 38.

[14] Cf. S. M. Burstein, "Images of Egypt in Greek historiography," in: Antonio Loprieno, ed., *Ancient Egyptian Literature* (Leiden, 1996), 591–604, esp. 596f.

Georgios the Synkellos (8th cent. AD) cites a figure of 11,985 years for the reigns of the gods (and thus close to that of Herodotus), with Hephaistos = Ptah assigned 9000 years. This Synkellos simply interprets as months, which allows "only" 727¾ years for Ptah. From sometime after the reign of Ramesses II, this Memphite god had usurped the place of the Sun-god Re at the head of the divine dynasty although Diodorus (I: 13, 2) still maintains the older tradition (with Helios as the first king of Egypt).[15] Eusebius claims that 13,900 years separated Hephaestus and "Bites", following which is another total of 11,025 years, and thus 24,925, which he then interprets as months like Synkellos, reducing them to 2,206 years, which fitted perfectly with the Biblical 2242 years between Adam and the Flood, while radically cutting the Egyptian temporal horizon.

In the traditional chronicle of the 30 dynasties, with 113 generations, the total number of years is named as 36,525, whereby the largest share of 30,000 falls to Hephaestus; as the last native Pharaoh Nectanebos, some 15 years before Alexander the Great, is assigned the Anno Mundi 5147. In his work on Life and Opinions of Philosophers, written around 200 AD, Diogenes Laertios goes further: he calculates that 48,863 years separated the invention of philosophy by "Hephaestus, the son of the Nile" and Alexander the Great—and he adds the number of solar and lunar eclipses in this period. From Zoroaster to Xerxes, the Lydian Xanthus reckoned 6000 years, and Plutarch gives a similar estimate in *De Iside* 46 placing 5000 years between Zoroaster and the Trojan War. This "older" Zoroaster, who belongs in the seventh mill. BC, plays an important part in modern esoteric literature, frequently as the teacher of Hermes Trismegistos.

The figure of the king "Menes" the Egyptians created a fictional beginning for the historical era. With echoes of the gods Min and Amun, it also served as a shortened version of the name of Thutmose III, and thus served in an ideal fashion as a link between the world of the gods and the Dynastic kings. It is not, however, a mere question of the identity of the names as the Egyptians were frequently satisfied with distant echoes. Every attempt to equate Menes with a concrete name of the Archaic Period, particularly Narmer and ʿAha, has been fruitless.[16] With the fictive image of Menes, known since the

[15] Immediately following this, however, he allows a variant that, "according to some priests" it was Hephaestos.

[16] On this issue, cf. Hornung & Staehelin, *Skarabäen*, 44–45, and H. Brunner, "Menes",

time of Hatshepsut and placed at the head of the list of kings for the first time by Sety I in the table of Kings at Abydos, the beginning of history is given a form, as in *Genesis* the beginning of humanity is attached to Adam as the first human. The Christian chronographers perceived the analogy and attempted to bring the two into temporal accord. As the founder of the Egyptian state, the deeds of Menes—emptying the swamps and founding Memphis—make him a bearer of culture.[17]

The universal historian Orosius reckoned some 5200 years separated Adam from the birth of Christ, and the figures used by the other early Christian authors generally fit into the same general framework. According to Sextus Julius Africanus (ca. 217) the Creation dates to 5500 years before the birth of Christ. Jerome (Hieronymus, 347–419) gives the date of 5198 BC, Victorius of Aquitaine is exact with 25/III/5201 BC. The medieval chroniclers, such as the Russian Nestor Chronicle from the early 12th century or the continuation of the Chronicle of the Frankish kings by Fredegar reckon that the world began around 5200/5500 BC, while the Jewish Calendar places it slightly later, 7/X/3761 BC, although the Kabbala of the 13th and 14th centuries estimated the duration of the worldly ages at 7000 years each, the succession ending absolutely in the 50th millennium.[18]

This temporal horizon, with a maximum of six or seven thousand years, was maintained through the Renaissance, and even to some extent afterwards. The 18th century Freemasons began their calculations with the round figure of 4000 BC (which is also found in Zedler's *Universal-Lexikon*),[19] athough in 1704 Père Pezron made Year 1 of the world 5872 BC, and thus substantially earlier;[20] whereby he also assigned priority to the Assyrians and Chinese, before the Egyptians. It was at about this time that Isaac Newton attempted to "improve" the Egyptian chronology, in order to recover the priority for the Old Testament, and because the Egyptians "in their vanity had made their monarchy

LÄ IV (1982), 46–48; there is also material from Nubian Sai, discussed by J. Vercoutter, "A propos des *Mni* = Ménès", in: S. Israelit-Groll, ed., *Studies Lichtheim*, II 1025–1032, and the link with Memphis by J. P. Allen, "Menes the Memphite", *GM* 126 (1992), 19–22.

[17] H. Brunner, "Menes als Schöpfer", *ZDGM* 103 (1953), 22–26.

[18] G. Scholem, *Die jüdische Mystik in ihren Hauptströmungen* (Frankfurt, 1967), 195.

[19] Johann Heinrich Zedler, *Grosses vollständiges Universal-Lexikon* (Halle & Leipzig, 1749) LXI, col. 818.

[20] Paul Pezron, *Defense de l'antiquité des tems* (Paris, 1704).

a few thousand years older than the world".[21] He could not imagine that only a century later William Herschel would work with the hypothesis that the world was two million years old, and that even Kant had assumed a substantially greater temporal horizon.

It is a fascinating and still undescribed phenomenon how the great voyages of discovery moved in parallel so that the Spanish, British, Portuguese and other seafarers moved forth into hitherto unknown parts of the world, bringing new continents into view, and thus the new discoveries in space went hand in hand with the extension of time, ultimately exploding the far too narrow temporal confines of the Christian chronographers. And, again Egypt played a decisive role since the ancient pre-Christian records were again put to use from the Renaissance onwards. The decisive quantum jumps which continue up to the present day began in the late 18th century as the study of geology began. In 1778, Buffon estimated the age of the earth at 100,000 years, a figure which was used by Goethe in Faustus when Mephistopheles remarks on Faustus's vision of ruling the sea:

> This is naught new for me to explore
> Knowing this a hundred thousand years of yore (verses 10210f.)

Similarly Cuvier, who in an elegant phrase of Heinrich Heine's, "proved in the most ungallant fashion that our mother earth is many thousands of years older than she had hitherto admitted",[22] and Jean Paul is surprised that "the earthy sphere . . . grows older by the day, backwards (and not just forwards)".[23] It must have been a deeply wrenching experience for the times that the firmly established temporal horizon of the Creation in the OT would be weakened with such terrifying speed.

With the temporal requirements of geology demanding ever greater spans of time, the 19th century saw the final abandonment of the chronology of the OT.[24] In 1870, Lepsius still assumed that the most ancient remains of mankind and their worked stones were 30 to 50,000 years old.[25] However, millions of years were soon accepted; even Herschel,

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[21] Isaac Newton, *The chronology of ancient kingdoms amended* (London, 1728), 191.

[22] Heinrich Heine, *Französische Zustände*, Artikel VIII, 27/V/1832.

[23] Jean Paul, *Der Komet oder Nikolaus Marggraf: eine komische Geschichte* (1822), chapter VI, note.

[24] The trail-blazing three volume work of Charles Lyell, *Principles of Geology* (London, 1830–33), with numerous improved editions.

[25] R. Lepsius, "Über die Annahme eines sogenannten prähistorischen Steinalters in Ägypten", *ZÄS* 8 (1870), 89–97, 113–121, esp. 90.

whom Jean Paul cites, reckoned with 2 million light-years for the most distant stars, and thus a corresponding age for the universe; Kant refers to "millions of years and centuries" in his *General Natural History and Theory of the Heavens*. In the 20th century, astronomy would change this to billions of years—whereby we come closer to the Ancient Egyptians. In 1929, Hubble's discovery of the expansion of the universe gave another push. We have now all experienced an age during which the cosmos gets to be billions of light years larger, and consequently older, every couple of years. In fact, the process does not appear to be finished—a fine example of how rapidly one can adjust to the extreme acceleration of exploding time in history.

After this time travel to the further horizons, we can return to Egyptian chronology, as we understand it today. From the beginning, Egyptology had an intense preoccupation with chronology, and generally took the highest available figures of antiquity, which were once again in vogue since the Renaissance—rather than the Biblical figures. Champollion-Figeac placed the debut of the Dynastic Period at 5867 BC, and that of Dyn. 18 at 1822; John Gardner Wilkinson who always preferred to orient himself on the OT used the values of 2320 and 1575; Lepsius lay between them at 3892 and 1591.[26] One can see that they rapidly came close to the presently accepted dates for the NK, but that the earlier period was still the subject of great differences in the 19th and early 20th centuries AD. Petrie consistently maintained that the historical period began in the 6th millennium and even in 1935 Borchardt put Menes at 4056 BC whereas Eduard Meyer, followed by Breasted, came close to our own estimates with 3315. Fundamental for the earlier chronology was the discovery of the Illahun Papyri (ended in 1899) with their Sothic and lunar dates which offered the first fixpoint before the NK. We can marginally note that even in 1870, Lepsius (immediately joined by Georg Ebers) energetically dismissed an Egyptian prehistoric stone age, and attributed all of the stone tools to the historic period.[27] It was only after 1890 that a window into the deeper prehistoric past of Egypt was opened with a series of blows beginning with the discovery of the Naqada culture and fundamental

[26] A. Wiedemann provided a useful synopsis of the early propositions in *Ägyptische Geschichte* (Gotha, 1884), 732f, and Borchardt, *Annalen*, 48–51, enlisting their "Main Errors".

[27] Lepsius (n. 25); cf. Georg Ebers, "Über die Feuersteinmesser in Aegypten", *ZÄS* 9 (1871), 17–22.

reflections of Georg Steindorff. After some initial uncertainty with a broad spectrum of variations, the framework was gradually refined in the course of the 20th century, and C-14 dates for the OK now lead to considerable irritation when they lie a mere century above the otherwise acceptable values.

Egyptian chronology is still the touchstone by which all of the other chronologies in the ancient world are measured and the issue of its reliability is thus central. A survey and examination of the chronological prospects for the third and second millennia BC in the different parts of the ancient world was the object of a series of meetings, beginning with Gothenburg in August 1987 at the initiative of Paul Åström,[28] and continued in August 1990 by Manfred Bietak at Schloss Haindorf,[29] and in November 1996 at the same venue, and then in May 1998 in Vienna. These last two already took place under the auspices of Bietak's major *Sonderforschungsprojekt* (Special Research Project) "Synchronization of Civilizations in the Eastern Mediterranean in the 2nd millennium BC"; another conference was held at Haindorf in May 2001.

Åström chose the title "High, Middle or Low" for his symposium and thus placed his finger on the central question, which is still not solved today: the choice between a longer, shorter, or medium position for Hammurabi of Babylon. The conference in Gothenburg did close with a formal vote on which of the three alternatives the participants preferred: against 3 votes and 3 abstentions, the "Low" chronology was adopted, and it is absolutely clear for Egypt that for the NK, this is the only chronology with which we can live. There, I endeavoured to avoid the astronomical problems when discussing the chronology of the NK, and Kitchen also stresses in his most recent contribution that the Egyptian chronology "is not based on these meagre astronomical data".[30] Helck was not a friend of astronomical data either.[31]

The apparent precision of astronomical and other sources from the natural sciences (including the ice of Greenland) is always enticing, and it is difficult to resist the charm. However, we should recall just how long it was generally agreed that the original introduction of the Egyptian

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[28] Cf. Åström, ed., *High, Middle or Low?*
[29] Published in *Ä&L* 3 (1993).
[30] K. A. Kitchen, in: M. Bietak, ed., *SCIEM* 1996/98, 39.
[31] He stressed in "Zur Chronologiediskussion über das Neue Reich", *Ä&L* 3 (1992), 63–67, that the dated monuments should be awarded priority before the astronomical data.

calendar produced Eduard Meyer's "oldest date in world history" of 19/VII/4241 BC—until this was demolished by Otto Neugebauer and Alexander Scharff in 1939. Even v. Beckerath's "earliest absolute date in Egyptian history" (*Chronologie*, 45) is an astronomical date (the heliacal rising of Sothis at Illahun) and cannot be maintained. The controversy surrounding the Venus-dates in Mesopotamia, and the constantly renewed and alternatively calculated eclipse-dates in Western Asia (which do not touch Egypt) or the Sothis and lunar dates in Egypt have repeatedly demonstrated the problems of the astronomical dates and contributed to the primacy of the purely historical dates. They are and remain our most important source.

In an inscription in Karnak, the HP Osorkon proclaims that the cult was regularly performed, "even as the moon in its course" due to his efforts,[32] and thus the moon and its regular phases would appear to be the very pattern for precision. But lunar dates are repeated at quite short intervals and are hardly useful if they cannot be embedded in a fine mesh of other reference points, as is, for example, the case for the Illahun dates. From 21 lunar dates in that archive, R. Krauss has now calculated the alternative dates for the first year of Senwosret III at 1862/61 or 1837/36 BC, and here it is the large number of dates which really brings weight since a single lunar date can bring no more than one further confirmation for a date which has been calculated using other means. Sothic dates with all of their countless parameters and uncertainties are likewise only of value as confirmations, and can never serve as the point of departure. And it almost never goes without any editing.

In addition, the Egyptian scribes probably never aimed for such precision; rather in their administrative tasks they will have been satisfied with rough approximations. It is thus that J. J. Janssen, who is profoundly familiar with their work, notes the "accuracy of the Egyptian scribes which is notoriously unreliable".[33] This will have applied to their methods of measuring time, which was extremely successful despite all its unreliability. The Egyptian calendar never depended upon intercalations and is of winning simplicity. This applies not only to the constant length of the year, but also the schematic division of the year (three seasons, best given their Egyptian names, *Akhet, Peret* and *Shemu*,

[32] *Reliefs* III, pl. 16; Caminos, *Chronicle*, § 32 and 37f.
[33] Janssen, *Varia*, 101.

each of four months of 30 days each). In Pharaonic times there was never an era with a constant continuous numbering of years: with each new Pharaoh, the count began anew.

Egyptian scribes thus had no inhibitions about copying older texts *in extenso* without "modernizing" them, and the campaigns of a Pharaoh could be used by another later pharaoh; royal constructions could be newly dedicated with the addition of new names. But the framework of Egyptian history can only be relative, using contemporary dates from three millennia. Nevertheless here, encouraging progress has been made in the primary task of establishing a correct sequence of kings.

As a festival celebrated (with the object of replenishing his powers) in the 30th year of a king's reign,[34] the *sed*-festival is chronologically relevant, and has frequently been included in chronological discussions. The apparent exceptions to the 30-year rule led to the assumption that this festival was regularly celebrated every 30 years, regardless of actual reigns. However, most of the exceptions have been eliminated, and there remain only a few uncertain cases (Hatshepsut, Akhenaten), which can be explained in terms of particular circumstances. In the case of Hatshepsut, the celebration can be linked to the accession of Thutmosis I (or II); in Akhenaten's case it can be anchored to the transition to the worship of Aten as king. A rigid 30-year sequence—as has occasionally been proposed—is improbable in the extreme.

The most certain and best documented cases of a *sed* festival which was actually celebrated concern reigns where the chronology does not offer any difficulties (Amenhotep III, Ramesses II, Ramesses III). In a number of rather dubious cases, the alleged evidence of a *sed*-festival has been used to argue a reign of more than 3 decades, even where there is otherwise no evidence. This concerns Amenhotep II and Thutmose IV in particular, but all of the "sources" for the *sed*-festivals of these rulers are mere wishful thinking, although Wente and Van Siclen refer to "jubilee evidence in favor of a long reign for Thutmose IV".[35] They also take the alleged *sed*-festival of Hatshepsut as the basis for proposing a reign of 13 years for Thutmosis II.[36] A *sed*-festival is also proposed with regard to the length of the reign of Senwosret III.[37]

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[34] On the issue of the date, etc., cf. Hornung & Staehelin, *Sedfest.*

[35] Wente & van Siclen, "Chronology", 230.

[36] Wente & van Siclen, "Chronology", 226.

[37] J. W. Wegner, "The Nature and Chronology of the Senwosret III-Amenemhat III Regnal Succession: Some Considerations Based on New Evidence from the Mortuary

Such conclusions are too risky, and this also applies to the references to a "first time of the *sed*-festival" by kings of the MK and NK. Were we to use this in, e.g., the case of Amenhotep I as a reference demonstrating a reign of more than 3 decades, then we would come into conflict with the documented reign of 21 years,[38] and in the case of Psammetichus II whose reign is certain to have lasted 6 years, the "first time" cannot have any real meaning, and the same is true of Shoshenq I, likewise with 21 regnal years.

With Hatshepsut, the "repetition" of *sed*-festivals, promised by Amun and Thoth in their divine speeches in the *chapelle rouge* at Karnak cannot be taken at face value. With Amenhotep II and Thutmose IV, "the first time and repetition of the *sed*-festival" is merely the expression of a wish, which cannot allow any historical conclusions. Only with a "second time of the *sed*-festival", known for Pepy II as well as the Archaic kings Den and Qa-ʿa,[39] do the sources depart from the wishful "repetition", and this also applies to the "3rd *sed*-festival" of Thutmose III and Amenhotep III, as well as the multiple repetitions documented for Ramesses II.

The abundance of *sed*-festival wishes, documented for virtually all the dynasties, has no chronological importance. The *sed*-festival was merely understood increasingly as an ideal measure of time and used in parallel with other concepts of time, precisely in order to wish Pharaoh the longest possible regnal era, whereby the hoped for chain of jubilee-festivals can be projected into the Beyond. Eduard Meyer already suggested "that this festival cannot be used for chronological purposes",[40] and recent research gives us no reason to change this appraisal.

Aside from the astronomical dates, the physical sciences offer a number of other aids, among which C-14 radiocarbon dating has been

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Temple of Senwosret III at Abydos", *JNES* 55 (1996), 249–279, esp. 262–264, pleading for a real celebration.

[38] In the inscription of the "astronomer" Amenemhet, L. Borchardt, *Die altägyptische Zeitmessung* (Berlin & Leipzig, 1920), Pl. 18. E. F. Wente, "Thutmose III's Accession and the Beginning of the New Kingdom", *JNES* (1975), 265–272, esp. 271–272 sought to use the references to a *sed*-festival and an alleged coregency with Ahmose to increase the length of the reign.

[39] For the references, cf. Hornung & Staehelin, *Sedfest.* For a new reference for Den on a bowl from Abydos, see G. Dreyer, "Umm el-Qaab: Nachuntersuchungen im frühzeitlichen Königsfriedhof 3./4. Vorbericht," *MDAIK* 46 (1990), 53–90, esp. 80, with Fig. 9. Against a 2nd *sed*-festival for ʿAdj-ib (so A. Grimm "Ein zweites Sedfest des Königs Adjib," *VA* 1 [1985], 91–98), cf. Kamil O. Kuraszkiewicz, "Noch einmal zum zweiten Sedfest des Adjib," *GM* 167 (1998), 73–75.

[40] E. Meyer, *Geschichte des Altertums* II, 1 (1953), 149, note 2.

widely used, and become indispensable for Prehistory and the Archaic period. For the Dynastic period this procedure is, however, neither sufficiently reliable nor sufficiently precise. Climatic or seasonal dates such as harvests, the inundation, or preferred dates for expeditions in the desert regions from either bank of the Nile can provide useful checks, but we still lack a systematic and modern collection of the available dates. Even today, historical periods and events continue to be explained in terms of climatic change,[41] although a causal relationship has never been demonstrated; the links with volcanic eruptions, such as Thera, have triggered debates, but not led to any definitive conclusions.

Highly problematic are dates based on stylistic, linguistic and palaeographic criteria. Here there are amusing discoveries, such as the dating of a Hellenistic bronze of Socrates to "ca. 700 BC", which I noted in the Manchester Museum. The "Memphite Theology" has been pushed back and forth across the entire history of ancient Egypt from the Archaic period to the Ptolemies, like the unstoppable efforts to date the NK Books of the Netherworld to the MK or even the OK. In sculpture, there are still difficulties in the attribution of statues dating to the MK and NK and the LP. The dating of the handwriting of the Brooklyn oracle papyrus 47.218.3 can serve as an exemplary warning. In this case, 50 higher officials and priests all personally signed a document as witnesses, in Thebes on October 4, 651 BC (Julian).[42] Examined individually, one would date the signatures quite differently, but the date of the protocol clearly assigns them all to exactly the same single day.

Synchronisms with the Near East are particularly useful when they can be linked to the relatively reliable Assyrian chronology. By contrast, the numerous synchronizations with the Hittites are virtually useless as the Hittite sources cannot provide either dates or regnal lengths. Our reliable point of departure remains the beginning of the reign of

[41] So, e.g., Th. de Putter, "Les inscriptions de Semna et Koumma (Nubie): niveaux de crues exceptionnelles ou d'un lac de retenue artificiel du Moyen Empire?", *SAK* 20 (1993), 255–288 associates the frequently discussed extremely high Niles dating to the end of Dyn. 12 with an "événement climatique"; for the movements of the Peoples of the Sea, cf. J. Neumann & S. Parpola, "Climatic Change and the Eleventh–Tenth Century Eclipse of Assyria and Babylonia", *JNES* 46 (1987), 161–182; a drought leads to famine and thus provokes the migrations. Cf. also S. J. Seidlmayer, *Historische und moderne Nilstände* (Berlin, 2001).

[42] R. Parker, *A Saite Oracle Papyrus from Thebes in the Brooklyn Museum* (Providence, 1962).

Taharqa in 690 BC[43] As Depuydt shows in his contribution, the sequence with a "day-exact chronology" begins on June 20, 688 BC (Julian), with the sale of a slave. The recently discovered inscription of Sargon II in the Tang-i Var Pass in western Iran from the year 706 does not offer absolute precision about his immediate predecessors, as had been initially hoped, and thus alternatives remain (Shebitku as coregent or sole ruler). And there remain many uncertainties in the TIP, as critics such as David Rohl have rightly maintained; even our basic premise of 925 for Shoshenq's campaign to Jerusalem is not built on solid foundations. Nevertheless, there is such a web of dates, genealogies and relations between Egypt and the Near East that dramatic changes can be excluded (whereas Rohl wanted to cut off 141 years), above all due to the adjoining Ramesside era. In addition, there is archaeological material (such as, e.g., coffins) which has generally not been exploited for dating purposes, and there remains the prosopography of the officials and priests. For the TIP, there remain also the aids offered by the apis-bulls with their very precise data.

Already at Gothenburg, there was general agreement about the dates for beginnings of the NK. Helck, Kitchen and Hornung/Krauss all worked with the very narrow range of 1540 to 1530 BC for the start of the reign of Ahmose, and after some debate, there is now general acceptance for the reign of Ramesses II at 1279–1213 BC. Although we must remain wary of confusing consensus with actual fact, for the NK we now have such a fine mesh of relative dates which are themselves also woven into NE dates that major adjustments can probably be excluded. While there is room for minor cosmetic corrections, we are relatively confident about the framework. And now NE material allows for the fall of Babylon to be set at ca. 1500 BC.[44] We can now trust that dendrochronology will provide greater precision—as the precise dating of the shipwreck of Uluburun with the Nefertiti scarab providing grounds for hope.[45] The links in both directions—backwards to Amarna and forwards to the Ramessides—mean that even for the ancient crux of the length of the reign of Haremhab, those favoring a

[43] Although L. Depuydt now also allows for the possibility of 691 BC, "Glosses to Jerome's Eusebios as a Source for Pharaonic History", *CdE* 76 (2001), 30–31, note 1.

[44] Gasche et al., *Dating*. They argue for 1499 BC, but allow alternatives for 1507 and 1491 BC.

[45] P. I. Kuniholm, B. Kromer et al., *Nature* 381 (1996), 780–783. Construction of the ship: 1316 BC.

shorter reign are so hard pressed for explanations that the controversy would appear to have been silenced. In chronological issues we can never take a single item and redate it while disregarding the larger context in which it is fixed. Herein lies the great value of Manfred Bietak's endeavor to synchronize the civilizations of the 2nd mill. by bundling and weaving them together.

After the departure of Parker and his "astronomically certain" dates there was a certain aporia with regard to the chronology of the MK. However, we will now have to take leave of Parker's date for the start of Dyn. 12 (1991 BC) and agree on a date around the middle of the 20th century (although ca. 36 years still separate v. Beckerath and Krauss, with Kitchen in the middle). This offers encouraging possibilities for the extension of the FIP, which has hitherto been cut short. It is painful to recognize that the Near Eastern synchronism of Neferhotep I will have to be dropped,[46] but a certain degree of scepticism is always required when dealing with synchronisms.

We are treading on very thin ice in the 3rd mill., even though fantastically precise dates based upon astronomical orientations of the pyramids are still being published.[47] While the general orientation does offer a certain framework, this is complemented by relative chronology. It no longer seems necessary to raise the dates for the pyramid-builders of Dyn. 4, to provide more building time and thus we can retain the 23–25 years of the king-lists. At the top we can begin with Dyn. 0 for the start of the Dynastic period in the 4th mill., which is essential for the synchronisms with the Near East.

The most recent large-scale summary of Egyptian chronology is Jürgen von Beckerath's *Chronologie des pharaonischen Ägypten* of 1997 which provides a balanced state-of-the-art picture of the foundations. In contrast to Beckerath, we strive to separate clearly relative and absolute chronology, and to provide more weight for the archaeological materials and the factors derived from the physical sciences.

Chronology has always been an arena for radical hypotheses and drastic moves. In antiquity, Christian chronographers manipulated Manetho's dates in order to achieve a convergence with the Biblical chronology.

[46] Cf. C. Eder, *Die ägyptischen Motive in der Glyptik des östlichen Mittelmeerraumes zu Anfang des 2. Jts. v. Chr.* (Louvain: OLA 71, 1996), 13; T. Schneider, Review of Eder, "*Motive*", *ZDPV* 114 (1998), 184.

[47] Cf. the critical remarks by E. Aubourg, "Détermination de l'orientation de la pyramide de Radjedef", *Genava* 49 (2001), 245–248.

At that time, the relative chronology was artificially lengthened whereas the 20th century has been marked by efforts at radical shortening, by eliminating dynasties or placing them in parallel with others; Velikovsky aimed at an extremely bold "analysis of events" by means of which similar events or historical constellations were simply slotted together—in this fashion Hitler's Russian campaign can be viewed as being the same as Napoleon's, and thus interpreted as the same event. . . . .

We will always be exposed to such attempts, but they could only be taken seriously if not only the arbitrary dynasties and rulers, but also their context, could be displaced. Were one to discover that Ramesses II was really Necho II in disguise, and likewise Merneptah as Apries and Ramesses III as Nectanebo I, one would still have to demonstrate that in each and every case the two allegedly identical rulers were also surrounded by the same officials, and that the religious and artistic contexts were also entirely compatible. In the absence of such proofs, we can hardly be expected to "refute" such claims, or even to respond in any fashion. For Dyn. 20 we have such a fine mesh of dates, virtually day-by-day, that the entire complex can hardly be assigned to another dynasty as it would simply fail. Furthermore, the entire so-called "dark ages" ca. 1200–700 BC are so well documented with archaeological material from Egypt that there is not the slightest ground for justifying a reduction. It is thus neither arrogance nor ill-will that leads the academic community to neglect these efforts which frequently lead to irritation and distrust outside of professional circles (and are often undertaken with the encouragement of the media). These attempts usually require a rather lofty disrespect of the most elementary sources and facts and thus do not merit discussion. We will therefore avoid discussion of such issues in our handbook, restricting ourselves to those hypotheses and discussions which are based on the sources.

It is characteristic that the drastic reductions touching upon the Old Testament play a very important role, as in antiquity. In order to make Hatshepsut the Queen of Sheba and thus the contemporary of Solomon, we are obliged to remove the 500 years which separate these two by aligning a number of dynasties in parallel, rather than sequentially. Here we face those ideological pressures which always have an unsuitably powerful influence on the study of historical data.

We have referred to the typically Egyptian association of the highest conceivable fullness of time with the solar orbit. "The lifetime of Re in heaven" was the absolutely highest conceivable temporal horizon for the ancient Egyptians, as the duration of being, comparable with the

lifetimes of galaxies in modern astronomy. According to the *Litany of Re* (13th appellation) it was "greater than the West and its images", and thus actually greater than the duration of the Beyond. In the *Book of the Celestial Cow*, this concept is transformed into an image where *neheh* and *djet* "those two old and great gods" appear as the pillars of heaven. As long as time endures, heaven will rest on its pillars and the solar orbit will be maintained daily. Long before the Pythagoreans, the Egyptians had postulated the concept of the eternal return, which was finally given its impressive form by Nietzsche who was in turn drawing on Goethe: "How often 'tis repeated! will always be/repeated through eternity" (Faustus verses 7012f.). But in Egypt, it was never the return of the same, but rather return in a form transformed: the sun is every day a new sun, reborn each day again by the goddess of heaven.

PART I

EGYPTIAN CHRONOGRAPHICAL TRADITION AND METHOD OF DATING

I. 1 ROYAL ANNALS

The Editors

Royal Annals of Memphis

There are several fragments which almost certainly derive from more than one stone slab, inscribed on both sides.[1] The fragment with most text preserved is the so-called Palermo stone; other pieces are in Cairo and London. Nearly all of them were known and had been studied in the first decades of the last century, and some specialists have proposed reconstructions of the original text.[2] The inscriptions which record events in the reigns of Dyn. 1 through part of Dyn. 5 are arranged in a series of rectangular compartments, set out in horizontal rows, reading from right to left. Each compartment in row 1 contains only the name of a mythical or early historical king. In the other rows, the hieroglyph for "year" defines the right side of a compartment. Below the compartments, the height of the annual Nile inundation for that year is recorded.[3]

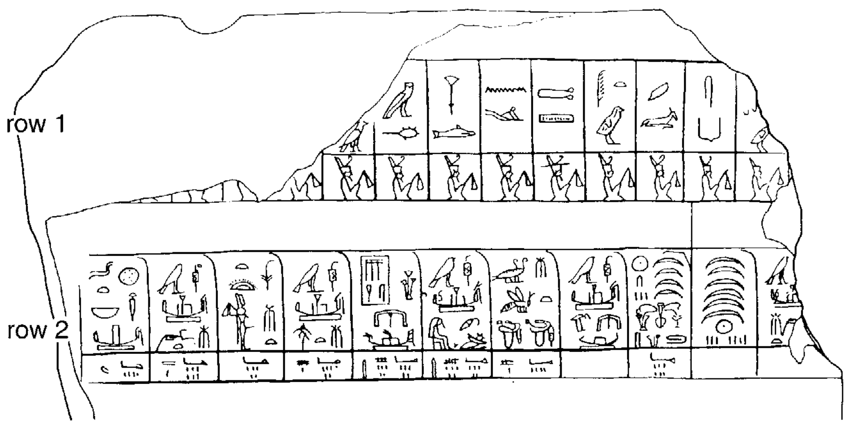


Fig. I. 1.1. Rows 1 and 2 on the Palermo stone (Verso)

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[1] Wilkinson, *Annals*, 28.
[2] Wilkinson, *Annals*, 29–36.
[3] Wilkinson, *Annals*, 18–19.

The inscription of the first incomplete compartment of row 2 cites "following of Horus" and "Birth of Anubis". The second and third compartments are separated by a dividing line that indicates a change of reign. The second compartment lists "6 months 7 days", presumably the time elapsed in the last incomplete year of that reign. The third compartment lists "4 months 13 days", evidently with reference to the new king, but the two intervals do not add up to a full year be it lunar or solar. The compartment also records two rituals associated with accession years, "the Unification of the Two Lands" and the "Circuit of the Wall".

For nearly all of the first three dynasties, the annals cite only occasions that gave a year its name. Beginning with Dyn. 4, the annals begin to resemble chronicles recounting a multiplicity of memorable events in each year of a reign.[4] The similarity of some so-called year labels of Dyn. 1 to certain entries in the annals suggests that both derive from the same archival institution.[5] Specialists do not agree on when the annals were compiled nor when the slab(s) were inscribed. Palaeography and the rendering of the royal names of the Early Dynastic Period favor of an OK date, but it cannot be excluded that the existing fragments come from later copies.[6]

As Wilkinson observed, most scholars who have studied the annals have interpreted the information recorded at face value, instead of considering the cultural context.[7] But even if cited events did not actually occur, the year itself may be accepted as fact. Being a later compilation, the annals are a less valid source for reconstructing regnal years of Early Dynastic kings than contemporaneous data would have been.[8] A definitive reconstruction of the Annals as a whole is not possible, and their value for the Early Dynastic period is problematic. A revision of the most recent attempt at reconstruction is made further below.

South Saqqara Stone and Later Annals

Annals of Dyn. 6 were inscribed on both sides of a slab measuring ca. 226 × 92 cms that was reused as a sarcophagus lid. At that time the

[4] Clagett, *Science* I, 48.
[5] Wilkinson, *Annals*, 60.
[6] Wilkinson, *Annals*, 23–24.
[7] Wilkinson, *Annals*, 65.
[8] Spalinger, "Texts", 281.

text was summarily erased. Baud and Dobrev analyzed the structure of the text and suggested readings of details.[9] Traces can be identified of the titularies of the Dyn. 6 kings Teti, Userkareʿ, Pepy I, and Merenreʿ which show that the count was biennial during their reigns.

From later times there is a portion of the annals of Amenemhet II containing chronicle-like entries.[10] The so-called annals of Thutmose III[11] report on a daily basis, whereas the others provide yearly overviews.[12] The annals of Pami list offerings donated to the cult in Heliopolis during his reign.[13]

Proposed Revision of Recent Reconstructions of the Memphite Annals Stone (Fig. I. 1.2)

The latest reconstruction of the annals proposed by Beckerath,[14] can be improved by taking into account Baud's corrections.[15] Any attempt at reconstruction must be based on a sound order of succession. This is the case for the kings of Dyn. 1 and for Hetep-sekhemwy, Raʿ-neb, and Ny-netjer of earlier Dyn. 2, since Kahl established that Weneg is the *nsw bjt nb.tj* name of Raʿ-neb.[16] The succession in the second half of Dyn. 2 is unclear. Traces of a *serekh* with the Seth animal on Cairo 1 suggest that Per-ibsen followed Ny-netjer, but it is also possible that Egypt was divided at that time. If so, the Annals might list the kings in succession although they actually ruled simultaneously. It has recently been confirmed that Kha-sekhemwy's successor was Netjery-khet (Djoser), not Nebka.[17] The sequence Kha-sekhemwy: Djoser is recorded in row 5 of the Palermo stone. Djoser's successor Sekhem-khet may be identifiable

[9] M. Baud & V. Dobrev, "De nouvelles annales de l'Ancien Empire égyptien. Une <Pierre de Palerme> pour la VIe dynastie", *BIFAO* 95 (1995), 23–92; idem, "Le Verso des annales de la VIe dynastie. Pierre de Saqqara-Sud", *BIFAO* 97 (1997), 35–42; see also below Baud, Chapter II. 5.

[10] H. Altenmüller & A. M. Moussa, "Die Inschrift Amenemhets II. aus dem Ptah-Tempel von Memphis", *SAK* 18 (1991), 1–48.—J. Malek & S. Quirke, *JEA* 78 (1992), 13–18.

[11] *Urk.* IV 645–673.

[12] W. Helck, *LÄ* I, 279.

[13] S. Bickel, M. Gabolde & P. Tallet, "Des annales héliopolitaines de la Troisième Période Intermédiaire", *BIFAO 98* (1998), 31–56.

[14] Beckerath, *Chronologie*, 174–179.

[15] Baud, "Ménès", 136–138.

[16] See below Kahl, Chapter II. 2.

[17] See below Seidlmayer, Chapter II. 3.

on the large Cairo fragment; the succession at the end of the dynasty is unclear.

Maximum and minimum distances between the Palermo stone and Cairo 1 can be determined on the basis of the preserved compartments for [Djoser] in row 5. Beckerath's change of reign after the first completely preserved compartment on Cairo 1 is spurious.[18] Rather, there are ½ + 9 compartments on Cairo 1 that belong to [Djoser]. If the lost titulary was centred and had a width of 7 compartments, then at least ½ + 9 + 7 + ½ + 9 = 26 compartments result for Djoser. If the first of the 26 compartments lay to the left of the Palermo stone, then the gap is 17 compartments or more. If the first of these compartments was identical with the first of [Djoser's] preserved ½ + 4 compartments on the Palermo stone, then the gap measures at least 12 compartments in row 5, exceeding the 9 compartments deduced by Wilkinson.[19] A gap of 12 compartments in row 5 is not compatible with a gap of 9 compartments in row 2. According to Kaiser the internal evidence of the Palermo stone and Cairo 1, including the correspondence of rows 2 to 5, favours 9 missing compartments in row 2 as does the regularity of the "followings of Horus" and the six-yearly bark festival in rows 2 to 4.[20] We accept Kaiser's arguments for the

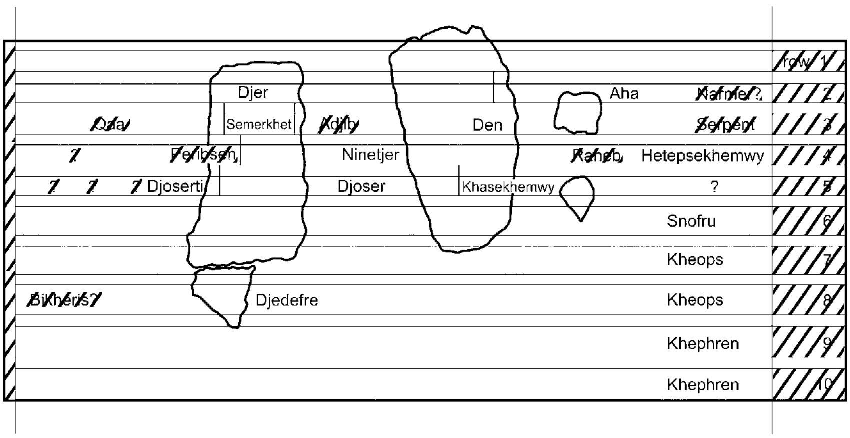


Fig. I. 1.2. Revised reconstruction of the Annals stone (Verso)

[18] Wilkinson, *Annals*, 53.
[19] Wilkinson, *Annals*, 79.
[20] W. Kaiser, *ZÄS* 86 (1961), 44.

size of the gap in row 2 and the corresponding gap of 13 compartments in row 5 in Beckerath's reconstruction.

The left edge of row 2, and thus of the other rows on the recto (if row 3 begins with "Serpent") can be determined with reference to the completely preserved titulary of Djer that spans 7 compartments. Taking into account the gap of 9 compartments in row 2 between Cairo 1 and the Palermo stone, there were 20 compartments before and after Djer's centred titulary, for a total of 47 complete compartments.

The determination of the right edge of the inscribed field is more difficult. Beckerath errs in identifying Kha-sekhemwy on the Palermo stone as Nebka and in construing the right edge of row 5 by adding the *TC*'s 27 years of Bebti (<Kha-sekhemwy) to the right of **Nebka's compartments. By contrast, extrema for the right edge can be determined in row 6 by extrapolating the early years of Snofru. The minimum number of compartments is 7 (*zp* years 1 to 6 and a year *zmꜣ-tꜣwy*), and the maximum 12 (adding *m-ḫt zp* years 1 to 5). Thus at least 16 and at most ca. 27 compartments belonged in row 2 to the right of Djer's reign. We opt for the maximum 75 compartments, corresponding to 74 years, because the incomplete last year of [ʿAha] and Djer's first one occupy two compartments. The recent discovery of a year tablet of Nar-mer makes it possible that row 1 recorded not only ʿAha, but also Nar-mer.[21]

The reign of Semer-khet is completely preserved in ½ + 7 + ½ compartments in row 3 on Cairo 1. Towards the left, ca. 24 compartments can be reconstructed for Qa-ʿa as the successor of Semer-khet, if the 47th compartment for Djer marks the left edge of the inscribed field. To the right of Semer-khet, half of a compartment and part of the last complete compartment of ʿAdj-ib are preserved without traces of his titulary; Wilkinson postulates at least ½ +7 + ½ compartments for him.

Beckerath assumes that Den celebrated the Sed festival which is attested on the Palermo stone in his 30th year. The assumption is unacceptable, if only, because Qa-ʿa celebrated two Sed festivals according to contemporaneous sources, whereas he ruled less than 30 years according to Beckerath's own reconstruction. The end of Den's titulary is preserved on the Palermo stone and its beginning on Cairo 5.[22] If Den's titulary had a width of 7 compartments, then at least ½ + 13 + 7 +

[21] Wilkinson, *Annals*, 72.
[22] Note, however, that Cairo 5 may be a forgery.

13 + ½ = 34 years are deducible, resulting in ½ + 11 + ½ years for ʿAdj-ib. At most ½ + 17 + 7 + 17 + ½ compartments can be proposed for Den, if ʿAdj-ib reigned a minimum of 8 years.

If the right edge of the inscribed field is defined by 12 reconstructed compartments for Snofru in row 6, then to the right of Den there should be at least 8 and at most 12 compartments for "Serpent". The reconstruction results in at most ca. 90 compartments in row 3.

Row 4 preserves a series of counts, combined with "followings of Horus" from the reign of Ny-netjer whose titulary is partially preserved. The example of Djoser in row 5 shows that the first count could occur as late as the second year. If so, then ca. ½ + 16 + 7 + 16 + ½ = 40 compartments are possible. If the width of the centred titulary amounted to 8 compartments, then 41 compartments result. The reconstruction yields a gap of 2 compartments at most between the 41st compartment of Ny-netjer and the following reign on Cairo 1. The dilemma cannot be solved by making the distance between the Palermo stone and Cairo 1 smaller, because we already presume the minimum distance.

The position of the titulary of Per-ibsen (?) as Ny-netjer's successor implies that the former's reign spanned about 10 compartments. The remainder of row 4 towards the left edge amounts to ca. 22 compartments (with the width of the Cairo 1 compartments), to be distributed among the kings of Dyn. 2.

Between Ny-netjer's reconstructed first year and the right edge of row 4 as defined by Snofru's reconstructed first compartment, there remain ca. 29 compartments (width of Palermo stone compartments) for Raʿ-neb and Hetep-sekhemwy. A reconstruction along these lines results in a total of at least ca. 104 compartments in row 4.

In row 5 the reconstruction of the preserved counts that are combined with "followings of Horus", allows the reconstruction of at least 10 lost compartments of [Kha-sekhemwy] and of another 1 + ½, if the first count and "following of Horus" occurred in the second regnal year. The result is 18 compartments for [Kha-sekhemwy], leaving ca. 17 compartments towards the right edge of row 5 for kings of late Dyn. 2. For [Djoser] ½ + 26 + ½ compartments can be reconstructed and 7 compartments for [Sekhem-khet] as his successor. The remaining ca. 16 compartments at the left end of row 5 belong to the last three kings of Dyn. 3. The reconstruction yields altogether 86 or 87 compartments at most.

About 19 compartments should follow after Snofru's *rnpt zp* 8 on the Palermo stone, if Djer's 47th compartment defines the left edge of the inscribed field. Reconstructed row 6 contains a maximum of ca. 34 compartments for Snofru.

Rows 7 and 8 of the recto of the Annals are mostly destroyed. Cairo fragment 3 shows Djedefreʿ occupying the last third of row 8, whereas the rest of it and all of row 7 must have belonged to [Cheops]. The short reign of Bicheris might have been accommodated at the end of row 8. If rows 7 and 8 amounted to more than 30 years for Cheops and Djedefreʿ, then row *9 would not be long enough for Khephren, and Beckerath is right in postulating a row *10. (Row 1 would yield at least 100, and at most 123 compartments, possibly corresponding to the 115 mythical kings listed in the *TC* before Menes.)

Altogether we estimate ca. 75 compartments (= 74 years) in row 2, ca. 90 compartments in row 3, ca. 104 compartments in row 4, and ca. 87 compartments in row 5, corresponding to ca. 164 years for Dyn. 1, ca. 141 years for Dyn. 2 (if the reigns recorded were successive), and ca. 50 years for Dyn. 3, or a total of ca. 355 years for Dyns. 1 to 3. The result is virtually the same as Kaiser's figure of 359 years, but markedly less than Beckerath's 393 years. The reliability of any sum is, however, open to question; whereas the order of succession as preserved in the Annals conforms to contemporaneous data, its relevance for counting regnal years remains conjectural.

I. 2 THE TURIN KING-LIST OR SO-CALLED TURIN CANON (*TC*) AS A SOURCE FOR CHRONOLOGY[1]

Kim Ryholt

Introduction

The King-list or "Royal Canon of Turin" is the only true king-list preserved from ancient Egypt before the Ptolemaic period. It is a "true king-list" in the sense that the compiler of the document aimed at recording all of the kings of Egypt along with their reign-lengths. This stands in striking contrast to the other lists, such as the cultic assemblages of deceased kings engraved on walls in the temples of Sety I and Ramesses II at Abydos and in the tomb of the priest Tjuloy at Saqqara,[2] even if these lists preserve the royal names in forms that are superior to those of the more or less contemporaneous *TC*.

Only two studies on the nature of the *TC* as such have been published; the first by Redford in 1986,[3] and the other by myself in 1997.[4] Studies of the chronological implications and attempts at reconstructions of the list have been more numerous. The most significant advances in the reconstruction touch the Late OK, FIP and the SIP.[5]

Around 1820 Bernardino Drovetti, French Consul in Egypt, acquired the *TC*, which eventually passed to the Turin Museum. The script is hieratic, written on the reverse of a discarded tax register dating to the reign of Ramesses II. Thus the king-list could have been written at the earliest in the time of Ramesses II himself. The *TC* can be accurately

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[1] For detailed discussion of the Turin king-list, see K. Ryholt, *Ä&L* 14 (2004), 135–155.

[2] See Redford, *Annals*, 18–24.

[3] Redford, *Annals*, 1–18.

[4] Ryholt, *Situation*, 9–33.

[5] Late OK: K. Ryholt, *ZÄS* 127 (2000), 87–100. FIP: J.v. Beckerath, *ZÄS* 93 (1966), 18–19. SIP: Ryholt, *Situation*, 69–75, 94–97, 118–119, 151–159, 163–165; for Frg. 134, cf. J. P. Allen, *BASOR* 315 (1999), 49–50.—W. Helck, *SAK* 19 (1992), 150–216, proposed a series of new arrangements, none of them based on autopsy. I could verify none of them whereas several can definitely be rejected, cf. Ryholt, *Situation*, 21. Note that Beckerath, *Chronologie*, 20, follows Helck's reconstruction.

described as a copy, drawn up in a somewhat careless manner on waste paper, from a damaged and imperfect original. The scribe apparently did not attempt to supplement missing information from other sources which may have been available at the time.[6] Apart from a section cut off in antiquity, the papyrus was presumably intact upon discovery. It has since been reduced to more than 300 fragments, apparently due to rough handling. Since Champollion first saw and described it in 1824, the papyrus has deteriorated considerably. However, thanks to the efforts of several scholars over the past 150 years, most of the larger fragments have now been joined. Yet, many of the very small scraps remain unpublished, and the position of many important fragments remains conjectural.

The papyrus has a large format, measuring 42 cm in height and about 1¾ m in length. There are now 11 columns; one or two were lost in antiquity when the piece of papyrus was cut off. It could have included Dyns. 17, 18 and part of Dyn. 19. What follows refers to a new reconstruction, in progress (Table I. 2.1).[7]

Table I. 2.1. Concordance between Gardiner's edition and the new reconstruction

Column 1	Gardiner col. I
Column 2	Includes Frg. 41–42 (Gardiner col. IX) and Frg. 150–152 and Frg. 22+unnumbered fragment (Gardiner col. X)
Column 3	Gardiner col. II
Column 4	Gardiner col. III
Column 5	Gardiner col. IV
Column 6	Gardiner col. V
Column 7	Gardiner col. VI
Column 8	Gardiner col. VII
Column 9	Gardiner col. VIII
Column 10	Includes Frg. 105+108 (Gardiner, col. IX), Frg. 138 (Gardiner, col. X) and unnumbered fragments (Gardiner, col. X.13–21)
Column 11	Gardiner col. XI

[6] Thus, for instance, the names of ten late OK kings are lost from TC and the damaged writings of the names of two following kings are intact in the Abydos List.

[7] For the new arrangement of the SIP section (columns 7–11) see Ryholt, *Situation*, 69–75, 94–97, 118–119, 151–159, 163–165.

Groupings of Kings; Headings and Totals

The *TC* lists three main categories of "rulers":

(1)	god and demigod kings (*nṯr.w*):	c. 1½ columns	Cols. 1-2 (bottom)
(2)	spirit kings (*ꜣḫ.w*):	c. ½ column	Cols. 2 (bottom)-3 (top half)
(3)	historical or human kings (~*rmṯ.w*):[8]	8½ columns	Cols. 3 (bottom half)-11

Each ruler's name and the length of reign, either precisely in years, months and days, or in years alone, was recorded.[9] The variations in detail provided for individual kings indicates that the *Vorlage* made use of a number of sources with different formats (Table I. 2.2). The most information is provided for the archaic kings; their reigns were recorded in years, months and days and their ages at death were also noted. But the royal names in this section are the most severely corrupted. The details are therefore not necessarily indicative of superior source material.

Table I. 2.2. Division of the Turin King-list into sections

Section	Period		Details provided about kings
A	Archaic Period	Dyns. 1–2	Years, months and days + Age at death
B	OK	Dyns. 3–6	Years alone[10]
C	Late OK &	Dyns. 7–8	Years, months and days
	FIP (Herakleopolis)	Dyns. 9–10	
D	FIP (Thebes)	Dyn. 11	Years alone
E	MK &	Dyn. 12	Years, months and days
	SIP	Dyns. 13–16	

Explicit information about the nature of a given group of kings is provided by headings, most damaged. The coherent bits of what remains may be translated as follows:[11]

[8] This division of the kings is based on Manetho's terminology, cf. Waddel, *Manetho*, 2–19.

[9] By contrast to Manetho gender goes unremarked. The *TC* included at least one female ruler, viz. Nofrusobk (7.2). Nitocris of Dyn. 8, who has hitherto been considered a woman on the basis of later tradition, seems to have been male; see K. Ryholt, *ZÄS* 127 (2000), 92–93, 99–100.

[10] There are two anomalies within this section where both months and days are recorded as well, i.e. *TC* 4.7 (a difficult royal name, or perhaps rather the record of a lacuna, recorded between Sekhem-khet and Huni) and *TC* 5.1 (Teti).

[11] Redford, *Annals*, 11–13, and Helck, *SAK* 19 (1992), 151–216, offer different recon-

Table I. 2.3

Heading for Dyns. 1–5 (3.10) "[Kings of the house of (?)] King Menes."
Totals for Dyns. 1–5 (4.26) "Total of kings from Menes until [Wenis: x amounting to 767 (or 768) years.]"[12]
Totals for Dyns. 6–8 (5.14–15) "[Total of] kings [until Neferirkareʿ: x] amounting to 181 years, 6 months, 3 days, and a lacuna of 6 (years). Total: 1[87 years, 6 months, and 3 days]."
Totals for Dyns. 1–8 (5.15–17) "[Total of] kings[13] [from] Menes; their kingship, their years, and a lacuna [thereto]: 9[4]9 years and 15 days, and a lacuna of 6 years. Total: [x kings amounting to] 955 years and 1[5] days."
Totals for Dyns. 9–10 (6.10) "Total: 18 kings . . ."—rest lost
Heading for Dyn. 11 (6.11) "Kings of . . ."—rest lost
Totals for Dyn. 11 (6.18) "[Total:] 6 kings who ruled 1[36 years] and a lacuna of 7 (years). Total 143 years."
Heading for Dyn. 12 (6.19) "[Kings of] the residence *ʾIṯ-tȝwy*."
Totals for Dyn. 12 (7.3) "Total of kings of the residence [*ʾIṯ-tȝwy*]: 8 who ruled 213 years, 1 month and 17 days."
Heading for Dyn. 13 (7.4) "Kings [who were] after the children (?) [of Dual] King [Sehet]epibreʿ."[14]
Totals for Dyn. 15 (c. 10.29) "[Total:] 6 [Hyk]sos. They ruled 1[0]8 [years]."

structions and translations. On the reconstruction of summations for Dyns. 6–8 and 1–8, see W. Barta, *MDAIK* 35 (1979), 13–14, and K. Ryholt, *ZÄS* 127 (2000), 91, 94–96.

[12] There is not space enough for this figure to have included years, months and days; possibly even the years were excluded and simply the number of kings recorded. The number of years is based on the summations for Dyns. 6–8 and 1–8.

[13] Lit. "kingship"; clearly an error.

[14] Reading *[ḥr]-sȝ ẖrd[.w]*, see Ryholt, *Ä&L* 14 (2004), 142, n. 38. An alternative reading *[ḥr]-sȝ ms[.w]*, which produces the same sense, was proposed by J. P. Allen at the colloquium *The Second Intermediate Period: Current research, future prospects* at the British Museum, 2004.

There is no heading for the kings of Dyn. 6, nor for the Herakleopolitan kings or those of Dyn. 14. Chronological details important from a modern perspective go unmentioned, above all, information on overlapping dynasties and coregencies. When two groups of kings overlap, they are simply listed consecutively. For example, the first Theban kings of Dyn. 11 follow the last Herakleopolitan rulers with whom they were contemporaneous.

The reign-lengths of Dyns. 3–6 and 9–10 recorded in full years alone pose a special problem. It remains unclear how these figures were rounded off. The reliability of the totals provided for groups of kings is intimately related to the accuracy with which the individual reigns were recorded. The totals provided for Dyns. 6–8 and 1–8 are subject to the same factors. The former total again includes a lacuna and both include a series of kings whose reigns are expressed only in years while others have reigns recorded in years, months and days. The total for Dyns. 1–8 includes no less than 26 kings recorded by years alone, resulting in a maximum margin of error of a quarter century. The part which appears to have suffered the most is the Late OK section (Dyns. 7–8). As noted above, a group of ten consecutive kings is entirely lost and the names of the next two are only partly preserved.[15] The lost kings are accounted for by the word *wsf* ("lacuna") in both the total for Dyns. 6–8 and that covering all of Dyns. 1–8.

The total of Dyn. 11 is recorded in full years only, obviously because the kings reigns were so recorded. Since the fractions of individual reigns are omitted, the total is inevitably approximate, with the margin of error amounting to few years. The error might be more significant if "Mentuhotep I", who never actually reigned as king, was assigned a fictitious reign-length. Finally, there is the lacuna referring to Mentuhotep IV and the question of the accuracy of the 7 years ascribed to him in the total for Dyn. 11.

There is a certain amount of evidence that several Dyn. 12 kings reigned jointly and that some coregencies could have lasted up to a decade. Yet the scribe who calculated the sums for the individual groups of kings was not aware of (or did not take account of) the overlapping reigns. He simply added the full lengths of individual reigns to calculate the total for the dynasty. The overlapping reigns probably

[15] J.v. Beckerath, *JNES* 21 (1962), 140–147; K. Ryholt, *ZÄS* 127 (2000), 96–99.

accounted for a bit more than 2 decades. Furthermore the *TC*'s information about Dyn. 12 is disquietingly incompatible with the ample contemporaneous sources.[16]

In the sections for Dyns. 13 and 14, the notations of at least two lacunae are preserved. One is recorded after the entry for Sonbef (7.6) and the other after Nebsenreʿ (9.14). It is not clear how many kings were lost, but at least one king can be identified by name in relation to the first lacuna, viz. Nerikareʿ.[17] Further kings may have been lost in the same sections.[18] There are two instances where reign-lengths are partially damaged. One is *ꜣw-ỉb-rʿ* of Dyn. 14 whose reign is recorded as "[*x* years], lacuna, 18 days" (9.12) and the other is *swsr-n-rʿ* of Dyn. 16 with "12 years, lacuna, [*x*] days" (11.8).

Relation to Manetho's King-list

It is significant that the five sections A–E in Table I. 2.2 all correspond to the dynastic arrangements Manetho adopted. Section A equates to Manetho's Dyns. 1–2, Section B to his Dyns. 3–6, Section C to his Dyns. 7–10, Section D to his Dyn. 11, and Section E to his Dyns. 12–16. The correspondence becomes even more striking when the textual division of the kings into groups is taken into account. The TC groups the following kings: Dyns. 1–5, Dyn. 6, Dyns. 7–8, and Dyns. 9–10, followed by Dyns. 11, 12, 13, 14, 15 and 16. The main difference from Manetho's list is that the *TC* does not split up Dyns. 1–2 (Archaic Period), Dyns. 3–5 (Memphis), Dyns. 7–8 (Memphis), and Dyns. 9–10 (Herakleopolis).[19] The few reigns of the OK that were not corrupted beyond recognition in Manetho seem to be either rounded up or down in comparison to the *TC*. Hence Manetho's figures seem to be based on a tradition with reigns recorded in years and months if not also in days.

[16] See below Schneider, Chapter II. 7.
[17] Ryholt, *Situation*, 318.
[18] Ryholt, *Situation*, 70 (Dyn. 13), 94–95 (Dyn. 14). Alternative interpretations have been presented by C. Bennett, *GM* 159 (1997), 11–17 and J. P. Allen, *BASOR* 315 (1999), 50–51.
[19] Cf. below Seidlmeyer, Chapter II. 3.

Conclusion

Despite its immense historical value, the *TC* is in various ways far removed from an ideal source. The incomplete state of preservation and inadequate publication inhibit full access both to the information it once contained and to what remains. There are also several intrinsic features that detract from its value as chronological source. If the scribe's priorities were historical, he was clearly not primarily concerned with either absolute or relative chronology. This is obviously not an ideal point of departure, and it warns us that there may be errors that we are presently unable to verify lurking in the document. Accordingly, the text should be treated with circumspection.

I. 3 KING-LISTS AND MANETHO'S *AIGYPTIAKA*

The Editors

Comprehensive king-lists are engraved on walls in the temples of Sety I and Ramesses II at Abydos, at Karnak and in the tomb of the priest Tjuloy at Saqqara.[1] They list kings in an apparently correct sequence and render their names in forms superior to those of the more or less contemporaneous *TC*. In the Abydos list, the names of ten kings lost from the Late OK section of the *TC* and two damaged names that follow are recorded intact.[2] By contrast, the king-list at Karnak from the time of Thutmose III, though mentioning a number of rulers omitted in other lists, does not give the names in historical sequence. Since all these lists served the cult of the deceased kings, the names sufficed, and further information, such as regnal years, was not necessary. None mentions kings considered to be illegitimate, for example Hatshepsut or the Amarna rulers. The later king-lists of Greek historians seem to derive from the annalistic tradition, rather than from such cultic king-lists.

In Book II of his *History*, Herodotus reported the names and correct reign lengths for the kings of Dyn. 26, and he stated that there were 330 earlier kings, including 18 Ethiopians and Queen Nitocris, but his information on the period prior to Dyn. 26 is virtually useless for reconstructing Egyptian history and chronology.

A king-list with 38 + 53 names and regnal figures is attributed to Eratosthenes.[3] Apollodoros preserved 38 names that were copied by George the Monk, known as Syncellus. No. 29 is easily recognizable: ΧΩΜΑΕΦΘΑ < *Sty mr.n Ptḥ*, i.e. Sety I who is given 11 regnal years, as is no. 36 ΣΙΦΟΑΣ < *ΣΙΦΘΑΣ, i.e. Siptah with 5 regnal years.[4] The names are accompanied by their secondary Greek translations, added only after noticeable corruption of the text occurred.

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[1] For the Abydos and Saqqara lists, see Redford, *Annals*, 18–24.
[2] Cf. above, Chapter I. 2.
[3] Waddell, *Manetho*, 213–225.
[4] Krauss, *Amarnazeit*, 274–276, with additional literature.

Diodorus utilized Herodotus and other sources for the chapters on Egypt in his *Bibliotheca Historica*.[5] As a rule he did not list regnal years, except for Kheops and Khephren where he follows Herodotus. Diodorus mentions five ruling Egyptian queens instead of Herodotus's single example.

Manetho's *Aigyptiaka* is purportedly the work of a priest who was a contemporary of Ptolemy II.[6] The *Aigyptiaka* displays remarkable similarity to the Turin King-list: rulers, including illegitimate kings recorded by name with reign length, arranged in groups, and listed in a sequence.[7] But there are two features which are specific to the *Aigyptiaka* and which have no counterpart in pharaonic tradition: glosses and antisemitism. The former reflect primarily Herodotus and Diodorus,[8] which suggests that the list may have been compiled after Diodorus. The antisemitism is manifest in the story of the enemies of king Amenophis, i.e. the lepers of Egyptian origin and the descendants of the Hyksos as common forefathers of the Jews.[9] Antisemitism is not attested before the Maccabeans;[10] therefore the story cannot be ascribed to Manetho in the 3rd century BC, but should rather be dated to the 1st century AD. The traditional explanation that Manetho made use not only of authentic records, but also of popular romances devoid of historical value,[11] does not take into account the motive of antisemitism and its history.

It is a fact that the *Aigyptiaka* was cited by none of the great compilers of antiquity like Pliny, Diodor, and Strabo, nor was it used by any known Alexandrian scholar.[12] When Apion cited the destruction of Avaris by ʿAhmose according to the Egyptian historian Ptolemy of Mendes,[13] he did so without mentioning the differing version in the

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[5] E. Murphy, *The antiquities of Egypt: a translation with notes of book I of the Library of history of Diodorus Siculus*, rev. and expanded (New Brunswick, 1990).

[6] G. Verbrugghe & J. M. Wickersham, *Berossos and Manetho* (Ann Arbor, 1999), 95–120.

[7] For Manetho's king-list, see Waddel, *Manetho*, and F. Jacoby, *Die Fragmente der Griechischen Historiker*, III C (Berlin & Leiden, 1958), no. 609.

[8] L. Stern, "Die Randbemerkungen zu dem manethonischen Königscanon", *ZÄS* 23 (1885), 87–96.

[9] M. Stern, *Greek and Latin authors on Jews and Judaism* I–III (Jerusalem, 1974–1984), 66–83.

[10] I. Heinemann, "Antisemitismus", in: Pauly-Wissowa, *RE*, Supplement vol. 5 (1931), 3–43.

[11] Meyer, *Chronologie*, 78–79; Gardiner, *Egypt*, 47; Beckerath, *Chronologie*, 35.

[12] G. F. Unger, *Chronologie des Manetho* (Berlin, 1867), 3; 116.

[13] A. Dihle, "Ptolemäus von Mendes", in: Pauly-Wissowa, eds., *RE*, Reihe 1, Vol. 23.2 (1959), 1861.

Aigyptiaka. The first to cite the *Aigyptiaka* was Flavius Josephus in *Contra Apionem*; subsequently, the christian chronographers Africanus and Eusebius cited it; still later Syncellos contributed greatly to the transmission.[14] The silence of authors earlier than Josephus and the anachronisms in the text arouse suspicion that it is a pseudepigraphic work, based on the authentic tradition of the annalistic king-list, but compiled after Diodorus.[15]

Gardiner's comments on the *Aigyptiaca* can be paraphrased as follows:[16] In Manetho's work the entire history of Egypt, after the reigns of the gods and demi-gods, was divided into 31 dynasties of royal families, beginning with Menes and ending with Alexander the Great's conquest in 332 BC. In spite of all the defects this division into dynasties exhibits, it has taken so firm a root in the literature of Egyptology that there is but little chance of its ever being abandoned. In the forms in which the book has reached us there are inaccuracies of the most glaring kind, these finding their climax in Dyn. 18, where the names and true sequence are now known from contemporary sources. Africanus and Eusebius often do not agree; for example Africanus assigns nine kings to Dyn. 22, while Eusebius has only three. Sometimes all that is vouchsafed to us is the number of kings in a dynasty (so in Dyns. 7–10, 20) and their city of origin. The royal names are apt to be so incredibly distorted, that of Senwosret I of Dyn. 12, for instance, being assimilated in the form of Sesonchosis to that of Shoshenk of a thousand years later. The lengths of reigns frequently differ in the versions of Africanus and Eusebius, as well as often showing wide departures from definitely ascertained figures. When textual and other critics have done their best or worst, the reconstructed Manetho remains full of imperfections.

None the less, Manetho did preserve details which have been conceded as historical by Egyptologists if only very late. An example is the name of a king Nephercheres, whom Manetho had placed in Dyn. 21; in the 1930s a small object bearing the name was found among

[14] See in detail Beckerath, *Zwischenzeit*, 11–20; idem, *Chronologie*, 35–38, assuming that the Aigyptiaka is authentic.

[15] Waddell, *Manetho*, VIII, XIV; E. Hengstenberg, *Manetho und die Hyksos. Beilage zu: Die Bücher Moses und Ägypten* (Berlin, 1841); R. Krauss, "Manethos Ägyptische Geschichte—eine ptolemäische oder römische Kompilation?", in: *Timelines. Studies in honour of Manfred Bietak*, E. Czerny et al., eds., (Leuven: OLA 149.3, 2006), 227–234.

[16] Gardiner, *Egypt*, 46–47.

the grave goods of Psusennes I in Tanis.[17] Another example is the ruling queen Akencheres (< ‘Ankhetkheprureʿ) of Dyn. 18, the daughter of a king, whose historical existence was archaeologically first confirmed in the 1970s.[18] Manetho's reign lengths are at times correct to the month, for example in the case of Ramesses Miamun, i.e. Ramesses II, who reigned for 66 years and 2 months according to Josephus's copy of Manetho. On the other hand, Manetho's pre-Dyn. 18 regnal figures often seem to be systematically distorted by multiples of ten,[19] probably in an attempt to bring Egyptian chronology into line with a version of biblical chronology.

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[17] Cf. below, Chapter II. 9.
[18] Cf. below, Chapter II. 8.
[19] Helck, *Manetho*, 81–83.

I. 4 GENEALOGY AND CHRONOLOGY

Morris L. Bierbrier

Genealogy, the study of family pedigrees, can provide a useful fix on proposed chronological schemes for ancient Egypt. Obviously the passage of time can be limited or, in certain instances, can be expanded, by the knowledge that an individual, his family, or a stated number of generations of a family, lived within a set period. It has been calculated that a generation might comprise 25–35 years on average, but, in the surviving ancient Egyptian documentation, we are not necessarily dealing in averages.[1] Thus the possibility remains that in certain cases an elderly father might produce a son who in turn might live to a great age and so throw any calculations off. A complex and interlinked genealogy might overcome this possibility but such genealogies are rare.

The use of genealogies in chronological research is limited by several factors. The most important of these is the lack of documentation. This is especially true of those periods when the chronology is most uncertain. In other periods, abundant documentation can lead to confusion as the same names are used repeatedly and identification of different generations may be uncertain. The documentation normally only refers to the elite families although occasionally at such places as Kahun or Deir el-Medina, information on lower-ranking families is forthcoming. It is now clear that the Egyptians practised some form of ancestor worship and records were certainly kept by some families of their ancestral lines although such information was not necessarily recorded on stone and thus has not survived to posterity.[2] The census records which survive give detailed information of families with both parents' names. It is of course true that Egyptians, like all other people down to this day, could be tempted to falsify their genealogies or

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[1] D. Henige, "Generation-counting and late New Kingdom chronology", *JEA* 67 (1981), 182–184.

[2] M. L. Bierbrier, *The Tomb-builders of the Pharaohs* (London, 1982), 95–6; J. Keith-Bennett, "Anthropoid Busts II", *BES* 3 (1981), 43–72.

at any rate to attach themselves erroneously to a good family line so particularly illustrious ancestries should be treated with caution. The genealogical information becomes fuller as time progresses and is especially voluminous from the late NK to the LP. Some pedigrees are known extending up to 13 generations, but it is usually difficult to fix these to a certain chronological range.[3] At least two pedigrees claim a genealogical link back to the MK. However, the inscription of Khnumibreʿ jumps abruptly from Dyn. 19 to Imhotep of Dyn. 3 and so cannot be taken as a serious link.[4] Similarly the inscription of ʿAnkhefensakhmet which names 60 generations, mostly holders of the high priesthood of Ptah, going back to the MK with the contemporary ruler for each, has too many gaps and inconsistencies to be accepted at face value.[5] It seems to have been put together from various lists of high priests (probably unrelated) and other ancillary material. It can only be used when independent information is available from other sources.

Another problem with genealogy is the lack of proper genealogical terms in the Egyptian language. "Father" *jt*, "Mother" *mwt*, "Son" *zꜣ*, "Daughter" *zꜣt*, "Brother" *sn*, and "Sister" *snt* are used, but there are no words for other relationships so "uncle" is "brother of my father" or "nephew" is "son of my brother".[6] To avoid such long circumlocutions, *jt* / *mwt* could be used for "father- / mother-in-law", while *sn* might also mean "brother-in-law", "nephew" or even" uncle", or might conceivably be no relation at all but a good friend and contemporary. The term *jt* can also be used to specify an ancestor and not just a father.[7] One could disentangle the exact relationships if proper documentation were available for all problems, but it is usually not.

With regard to maternal relationships, it is not always clear that the wife of an official is the mother of his children unless specifically stated.

[3] J.-C. Goyon, "Les cultes d'Abydos à la basse époque d'après une stèle du Musée de Lyon", *Kemi* 18 (1968), 29–44; R. El-Sayed, "Deux statues inédites du Musée du Caire", *BIFAO* 83 (1983), 135–143; L. M. Leahy & A. Leahy, "The Genealogy of a Priestly Family from Heliopolis", *JEA* 72 (1986), 133–147.

[4] Couyat & Montet, *Ouâdi Hammâmât*, Nos. 91–93; Wildung, *Rolle*, Doc. XVI.130, 83–84.

[5] Borchardt, *Mittel*, 96–100; C. Maystre, *Les grands prêtres de Ptah de Memphis* (Freiburg & Göttingen, 1992), 93–97.

[6] G. Robins, "The Relationships specified by Egyptian Kinship Terms of the Middle and New Kingdoms", *CdE* 54 (1979), 197–217; M. L. Bierbrier, "Terms of Relationship at Deir el-Medina", *JEA* 66 (1980), 100–107.

[7] G. A. Gaballa, *The Memphite Tomb-chapel of Mose* (Warminster, 1977), 22; Allam, *Ostraka*, 44.

Such a relationship is usually assumed but may not be correct. The guardian Penbuy of Dyn. 19 is known to have had two wives—Amentetwosret and Iretnefer. A stela shows Penbuy, Iretnefer and his adult son Amenmose, but another shows him with Amentetwosret and an infant Amenmose. In the first stela, Amenmose must be shown with his step-mother, but the stela gives no indication of this.[8] The dissolution of marriages by death or divorce would not have been uncommon, yet plurality of marriages is rarely documented.

For genealogies to have a major impact on chronological problems, it is essential that there must be a clear and uncontroversial link of genealogy to some fixed chronological point, usually the reign of a King. If links can be found with successive generations, the effectiveness of the genealogy with regard to the order of succession and more importantly the maximum passage of time becomes even more crucial. If the genealogy in question is that of the royal family itself, then the fixed links are self-evident. One important genealogy of this nature is that of Pasenhor of Dyn. 22 who traces his ancestry through 16 generations including four kings.[9]

Very little documentation, let alone genealogical information, survives from the development from writing ca. 3400 BC to the end of Dyn. 3. One key document, recently discovered at Abydos, is the dynastic seal of King Den of Dyn. 1 which lists his immediate predecessors: Nar-mer, ʿAha, Djer, and Wadj. The genealogical content is provided at the end with the name of the King's mother as Merytneith.[10] In view of her appearance, it is highly probable that not only do we have a dynastic listing but also a genealogical listing—father-to-son. Unfortunately, the length of time per generation can only be estimated. A second seal of the last king of Dyn. 1 lists all his predecessors, but leaves out Merytneith. It would be optimistic to assume a straight father-to-son succession throughout the whole dynasty. No such documentation survives for Dyns. 2–3 and here the order and genealogy of the kings remains uncertain.

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[8] M. L. Bierbrier, *Hieroglyphic Texts from Egyptian stelae etc. 10* (London, 1982), pl. 72; M. L. Bierbrier & H. de Meulenaere, "Hymne à Taouêret sur une stèle de Deir el-Médineh," in R. Holthoer & T. Linders, eds., *Sundries in honour of Torgny Säve-Söderbergh* (Uppsala, 1984), 23–29.

[9] Kitchen, *TIP*[1], 488, Table 19.

[10] G. Dreyer, "Ein Siegel der frühzeitlichen Königsnekropole von Abydos", *MDAIK* 43 (1987), 33–43; G. Dreyer, "Umm el-Qaab", *MDAIK* 52 (1996), 72–73.

While the amount of information about private families increases from Dyn. 4, the tomb inscriptions do not normally name the parents of the deceased but more usually only his wife and children. Thus it is extremely difficult to put together a lengthy and coherent genealogy apart from those of the royal families of Dyns. 4–6. There too many gaps remain and many of the reconstructions are speculative. What is certain is that the genealogical succession to the throne when known did not run smoothly and did not follow in generation sequence in all cases so the king-lists alone do not reflect generations; for example, Khephren succeeded his brother Raʿdjedef in Dyn. 4 and Raʿneferef was probably followed by his brother Neuserreʿ in Dyn. 5, while Nemtyemzaf I was followed by his brother Pepy II in Dyn. 6. Chronology here is indicated rather by the careers of these few officials who list the sovereigns that they served and so limit the time which has elapsed. Thus Sekhemkareʿ son of Khephren lived through the reigns from Khephren of Dyn. 4 to Sahureʿ of Dyn. 5 while Ptahshepses was brought up under Menkaureʿ and lived into the reign of Neuserreʿ. It has been suggested that Dyns. 3–4 and 4–5 were linked by marriages of royal heiresses, but there is no proof of this.[11]

Unfortunately, genealogy is not much of an aid in determining the chronology of the FIP. The genealogies of the royal families are uncertain and those of the nomarchs do not extend for enough time or present enough fixed links to prove crucial. The list of previous nomarchs in the tomb of Ukhhotep of Meir is unfortunately not complete or tied to any fixed points. Nor is it clear that the list is in any way genealogical.[12]

When adequate documentation occurs in the MK, there is still not enough material to present long coherent genealogies apart from the royal family of Dyn. 12 itself.[13] The papyri from Kahun allow a few families to be reconstructed and the succession of office holders, in one case father-to-son, confirms the dating order of some papyri.[14] However these fragments are not crucial to the relative chronology of Dyn. 12 which can be fixed by other methods.

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[11] *CAH* I/2, 145–189; M. Verner, *Forgotten Pharaohs, lost pyramids: Abusir* (Prague, 1994), 134–155 on Raʿneferef.

[12] A. Blackman, *The Rock Tombs of Meir* (London, 1915), III, 16–21.

[13] Franke, *Personendaten*.

[14] U. Luft, "Illahunstudien I: Zu der Chronologie und den Beamten in den Briefen aus Illahun", *Oikumene* 3 (1982), 101–156.

Similarly no consecutive genealogies can be found during the SIP. Some detailed genealogies of short-lived royal families can be put together, but the links between them remain tenuous and open to different interpretations. It is possible that some kings indicated their filiation in their royal names which would provide a genealogical sequence but this view has perhaps been pushed too far.[15] The later genealogies which claim to reach back to the MK cannot be taken seriously and seem merely to look to well-known historical figures without any genealogical consistency.

The advent of the NK led to an increasing amount of genealogical material in the form of statues, stelae, tomb inscriptions and papyri, both official and unofficial. The pedigrees of the royal families of Dyns. 18–19 can be constructed in some detail apart from the confusion which occurs at the end of the dynasties. The regnal years known from other sources fix a chronology which does not conflict with the royal genealogies. The private genealogies and careers of officials again confirm the standard chronology that there are not too many years missing from the known regnal years. For example, ʿAhmose Penekheb served from ʿAhmose I to Hatshepsut so guaranteeing that the reigns of Amenhotep I and Thutmose I–II cannot extend over too long a period.[16]

Until recently no family could be traced which extended from Dyn. 18 to Dyn. 19 with the slight exception of the parents of Ramesses I who must have lived then but are only fixed in relation to their son and the dubious genealogy of the high priests of Ptah. New research has revealed that the high priest of Amun Wennefer lived at the end of Dyn. 18, certainly during the reign of Haremheb and possibly that of Tutʿankhamun. His younger son Amenmose is well attested in the reign of Ramesses II, being in charge of the Ramesseum probably from early in the reign when doubtless adult. The career of father and son prove that the contentious reigns of Haremheb and Sety I should not be unduly long but are still too imprecise to determine for certain a long or short reign for Haremheb.[17]

From Dyn. 19 onwards much more genealogical information becomes available concerning the royal court, the officials, and even humbler

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[15] Ryholt, *Situation*, esp. 207–289.

[16] *CAH* II/1, 295.

[17] F. Kampp-Seyfried, "Die Verfemung des Namens *Pꜣ-rn-nfr*"; D. Raue, "Ein Wesir Ramses' II.", in: *Stationen*, 303–319 and 341–345.

folk such as the workmen of Deir el-Medina. The royal inscriptions now name in detail the king's sons, daughters and wives, while the tombs of the officials and workmen give the names of the parents, grandparents, in-laws, and other relations. This new information can be crucial in determining the length of uncertain periods or the maximum extent possible of reign lengths. For example, some uncertainty remains at the end of Dyn. 19 and the beginning of Dyn. 20 when it has been speculated in the past that an interregnum took place. The maximum year dates are known: Ramesses II, 66 years, 2 months (his last); Merneptah, 10 years, Sety II 6 years (his last), but it is not clear if the reigns of Amenmesses, 3 years; Siptah 7 years; Twosre 8 years; and Sethnakhte of Dyn. 20, 2 years are consecutive or contemporary with others.[18] However, certain individuals are attested who survive through this period into the reign of Ramesses III such as the vizier Hori, a great-grandson of Ramesses II[19] and the workman Nekhemmut son of Khons who is attested under Ramesses II and was a foreman in year 13 of Ramesses III.[20] The scribe Kenherkhepeshef is apparently attested at Deir el-Medina from year 30 of Ramesses II until the reign of Siptah, and his widow Naunakhte (who must have been a great deal younger than him) remarried, had eight children, and survived until the reign of Ramesses V.[21] In view of this evidence, it seems logical that Merneptah could not have reigned much longer than ten years. It is highly probable that Amenmesse's years are to be totally contained within those of Sety II and that Twosre backdated her reign to the death of Sety II, thus encompassing that of Siptah and so reigning two years not eight. In view of Sethnakhte's recently discovered stela, he may well have dated his reign from the death of Siptah or shortly thereafter and so was contemporary and not consecutive with Twosre. More importantly, there can have been no interregnum and so the time elapsed from the death of Sety II to the accession of Ramesses III was probably not much more than ten years if that.

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[18] If the highest known regnal date is the last, then the reign could have been as much as 11 months shorter. For the latest views on Siptah's reign see R. Drenkhahn, *Die Elephantine-Stele des Sethnacht und ihr historischer Hintergrund* (Wiesbaden, 1980); Jansen, *Village Varia*, 116.

[19] H. de Meulenaere, "Le vizier ramesside Hori", *Annuaire de l'Institut de philologie et d'histoire orientales et slaves* 20 (1968–72), 191–98.

[20] Bierbrier, *Kingdom*, esp. 30–33, corrected in M. L. Bierbrier, "The Family of Sennedjem", *CdE* 59 (1984), 199–213.

[21] Bierbrier, *Kingdom*, 26–29.

A great deal of documentary evidence is available for the regnal dates of Dyn. 20, and genealogical information confirms that few extra years should be added to those known, certainly not more than a decade. The case of Naunakhte has already been mentioned, but other families from Deir el-Medina can be traced from Dyn. 19 to the beginning of Dyn. 21. The family of Sennedjem runs from Dyn. 19 to the beginning of Dyn. 21, notably Nekhemmut junior who is attested in office from Ramesses IV to Ramesses IX. The family of Kaha can be traced from early Dyn. 19 to Ramesses XI. More importantly, the scribe Amennakhte was appointed to office in year 16 of Ramesses III and survived until Ramesses VI. His son is attested from Ramesses III to Ramesses IX, while his grandson appears from Ramesses VI to Ramesses IX. Three further generations are known through to Smendes of Dyn. 21.[22] The genealogies thus confirm that the extent of Dyn. 20 is most likely correct, and there are no substantial gaps in chronology.

From Dyn. 22 onwards a large body of texts on statuary and coffins record the genealogies of the royal families and the priestly class. Some of these extend back to Dyn. 21 and one even to Dyn. 19 although that genealogy is doubtful.[23] Although these genealogies are not precise enough to solve the various chronological cruxes of the period, they do link Dyn. 21 to Dyn. 26, and even with the provision of a genealogical jump or two, they limit the time period so that it is unlikely that the entire time span can extend further then has been postulated by Kitchen. It may be slightly abbreviated, but again the genealogies make clear that the time span cannot be radically less than the generally accepted chronology of the period. For example, the fourth prophet of Amun Djedkhonsuiuefankh, a contemporary of Osorkon I, has a great-great-grandson the fourth prophet of Amun Nakhtefmut, who was a contemporary of Osorkon III and whose granddaughter married into the Besenmut family which is attested from Dyn. 22 to Dyn. 26.[24]

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[22] Bierbrier, *Kingdom*, 19–44.

[23] Bierbrier, *Kingdom*, 51–53, where the line between Ipuy under Merneptah and Ankhefenkhons under Osorkon I is doubtful.

[24] For royal and priestly families of this period see Kitchen, *TIP*; Bierbrier, *Kingdom*, 45–108, with revisions in *Bibliotheca Orientalis* 36 (1978), 306–309; G. Vittmann, *Priester und Beamte im Theben der Spätzeit* (Vienna, 1978); J. Taylor, "A priestly family of the 25th Dynasty," *CdE* 59 (1984), 27–57; D. Aston & J. Taylor, "The Family of Takeloth III and the 'Theban' Twenty-third Dynasty," in Leahy, *Libya*, 131–154.

From Dyn. 26, the chronology of Egypt becomes firmly fixed to that of Persia, Greece, and ultimately Rome. Genealogy thus becomes for the most part unnecessary to determine chronological conundrums. However, family information can still prove useful in resolving some minor points at issue. Unfortunately, much of the genealogical information is patchy and uncertain with the most information from Thebes which was no longer the centre of major activity. Genealogies and individual careers can be constructed from surviving papyri and have been useful in confirming the dates of some of the obscure rebel pharaohs such as Harwennefer and ʿAnkhwennefer.[25] The survival of coherent genealogical material from the Roman Period is severely limited and is no longer of any practical aid in settling minor matters of chronology which remain.

[25] C. A. R. Andrews, *Catalogue of Demotic Papyri in the British Museum IV. Ptolemaic Legal Texts from the Theban Area* (London, 1990), passim for genealogies; P. W. Pestman, "A family archive which changes history", as well as, P. W. Pestman, "Haronnophris and Chaonnophris", in: *Hundred-Gated Thebes: Acts of a Colloquium on Thebes and the Theban Area in the Graeco-Roman Period*, S. P. Vleeming, ed., (Leiden: PLB 27, 1995), 91–137.

I. 5 METHODS OF DATING AND THE EGYPTIAN CALENDAR

The Editors

During Dyn. 1 years were not yet counted, but simply named, as exemplified by the so-called year labels of Dyn. 1 that were attached to oil vessels. Since the reign of king "Serpent", labels were additionally inscribed with the hieroglyph for "year" (*rnpt*).[1] Presumably eponymous occasions were selected at the outset of or early in the year, being scheduled or symbolic and only coincidentally historical.[2] The labels are the earliest evidence for reckoning time by years,[3] but the type of year, that was in any case civil, not regnal, is not known. The annals attest that the "months" and days of [ʿAha's] last year and [Djer's] first year, add up to 10 "months" and 20 days, less than either a full lunar or solar year. The figures cannot be explained until further information comes to light; perhaps they are just a scribal error.

Rnpt zmꜣ-tꜣwy designated an incomplete accession year at least as early as [Djer] down through Dyn. 8. How the following years were expressed changed over time. At least from the penultimate year of [ʿAha] and through the end of Semer-khet's reign, i.e. for most of Dyn. 1, the annals record the biennial occurrence of "following of Horus", but there was no successive numbering of them.[4] Between Ny-netjer and Khasekhemwy at the end of Dyn. 2 the annals document a dating system that was based upon a regular biennial census (*ṯnwt, jpt*),[5] numbered successively within a reign and coinciding with the biennial "following of Horus". Whereas the "following of Horus" is still attested for Djoser, the biennial census is not. When it reappears under Snofru, it is not a regular biennial event. According to the annals, the 8th occurrence

[1] The earliest known "year label" dates from the reign of Narmer, see G. Dreyer, *MDAIK* 54 (1998), 138–139.
[2] Wilkinson, *Annals*, 63–64.
[3] Helck, *Thinitenzeit*, 144–175.
[4] Wilkinson, *Annals*, 90–91.
[5] Edel, *Grammatik*, 179–180.

of the census followed the 7th occurrence without an intervening census-free year. Contemporaneous dates from Snofru's pyramid at Maidum attest a series of annual counts, recorded as *rnpt zp* x (year of the xth count),[6] interrupted now and then by a *rnpt m-ḫt zp* (year after the xth count).[7] Scholars are at odds about whether there was a regular biennial count thereafter during the OK; the annals of earlier Dyn. 6 indicate a biennial count.[8]

Beginning in Dyn. 11 successive calendar years during each reign were counted. Gardiner presumed that during the MK the kings dated their second regnal year from the New Year's Day (I Akhet 1) following the actual day of their accession, so that their first year consisted merely of some months and days after the demise of their predecessor.[9] This may have been the case, since pBerlin 10055 from Illahun attests that year 1 of [Amenemhet III] followed directly on year 19 of [Senwosret III],[10] which may reflect the accession of Amenemhat III after Senwosret III had died in the course of year 19 or 20. But it may also signify that a coregency began after year 19.

In Dyn. 18 a new system was adopted which continued until at least ca. 800 BC.[11] Year 1 began on the actual day of accession and the following years were counted, accordingly, from the anniversary in the civil year, so that the civil year now always spanned parts of two regnal years. From Dyn. 26 through the Roman period the antedating system was introduced so that regnal year 2 began on I Akhet 1 after the accession.[12]

During the entire pharaonic period the concept of an "era" was employed only once. The *wḥm mswt* era began in 19 Ramesses XI and lasted at least 10 and perhaps as much as 12 years.[13] The so-called 400 year era of Seth Nubti[14] should also be mentioned, as well as the attribution of the Amarna pharaohs' reigns to Haremhab.[15] During the

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[6] For the reading *rnpt zp*, see E. Edel, *JNES* 8 (1949), 35–39; Gardiner read *ḥꜣt zp*, see his *Grammar*, Excursus C.

[7] See below, Chapter II. 4.

[8] See below, Chapter II. 5.

[9] Gardiner, "Years", 21–23, followed by Beckerath, *Chronologie*, 10.

[10] When Gardiner wrote, the date in pBerlin 10055 was mistakenly associated with Senwosret II and III.

[11] Cf. below Jansen-Winkeln, Chapter II. 10.

[12] A. Leahy, *JEA* 74 (1988), 187.

[13] See below, Chapter II. 8.

[14] Cf. Beckerath, *Zwischenzeit*, 161.

[15] See below, Chapter II. 8.

MK, the nomarchs counted their years of office independently from royal years,[16] and it is quite possible that the Theban HP's of early Dyn. 21 counted their pontifical years.[17]

The Solar Calendar of 365 Days

There were 12 months of 30 days in the Egyptian calendar, supplemented by five additional days, the so-called epagomenal or "added" days, for a total of 365 days. A tendency to regard the year as amounting to only 360 days is evident, for example when the daily income of a temple is stated to be one 360th of the yearly revenue.[18] The well-known disregard of the epagomenai in calendar schemes seems to be another consequence of this tendency.[19]

Dates within a year were expressed in terms of the three seasons of four months each: Akhet (*ꜣḫt*), "inundation"; Peret (*prt*) "winter", presumably the season of the "emergence" (*pr*) of the fields from the flood; Shemu (*šmw*) "summer".[20] Originally months were numbered, not named, but a few month names are known from the MK.[21] Varying series of names are documented for the months in the NK from which the Greek, Aramaic, and Coptic names of the civil months derive; Ptolemy used the Greek names.[22]

The heliacal rising of the fixed star Sirius (Egyptian: Sothis) was the only astronomical event which occurred on a certain day in the 365-day civil calendar (see below, chapters III. 9.10). Because the calendar did not provide for an extra day every 4 years, the date of the rising of Sirius in the civil calendar shifted accordingly. The concept of a "Sothic cycle" for a complete shift of 1460 years (i.e., 365 days × 4) is first documented in the Hellenistic Period. The earliest examples for dating in the civil calendar of 365 days come from Djoser's reign,[23] or ca. 150 years after its introduction.

[16] Cf. for example W. K. Simpson, *JARCE* 38 (2001), 7–8, regnal year 43 of Senwosret I corresponding to year 25 of the nomarch Amenemhet.
[17] See below, Chapter II. 9.
[18] Cf. G. A. Reisner, "The Tomb of Hepzefa, Nomarch of Siut", *JEA* 5 (1918), 84.
[19] Cf. for example, Leitz, *Studien*, 5–6; A. J. Spalinger, *OLZ* 87 (2002), 25.
[20] Gardiner, *Grammar*, Excursus C.
[21] J. P. Allen, *The Heqanakht Papyri* (New York: PMMAEE 27, 2002), 135–137.
[22] See below, Chapter III. 11.
[23] J. Kahl, N. Kloth & U. Zimmermann, *Die Inschriften der 3. Dynastie* (Wiesbaden: ÄA 56, 1995), 70–71.

Calendar Adjustment

R. Weill has played with the idea that the SIP was shorter than the standard chronology allows, implying that at a calendar adjustment days had been cut out of the 365-day year.[24] Parker argued against the feasibility of such an adjustment;[25] his arguments were reinforced by Depuydt.[26]

It is indeed correct that Pharaonic sources do not attest an intercalated day.[27] But what if the Egyptians added or lost a calendar day in the course of their history, be it by intercalation or by mistaken day counting? The close agreement between late Egyptian and general chronology precludes such an error or deliberate intercalation after the beginning of the Saite Period. The loss or gain of a calendar day would shift the absolute date of a recorded lunar date by either exactly −11 (−14) years or by exactly +14 (+11) years.[28] Shifts of this size are not compatible with the standard chronology of the NK. Furthermore the supposition of an intercalated day would break the link between the lunar date and a Sothic date implicit in the astronomical dates of the Illahun archive.

It is well known that in 238 BC Ptolemy III attempted to introduce an improvement in the Egyptian calendar by adding a 366th day every four years, anticipating the later Julian calendar reform. But his edict went unheeded. A second attempt under Augustus succeeded in imposing a form of the Julian calendar on Egypt. This so-called Alexandrian calendar remained in use in Egypt until the Arab conquest, and it still survives today as the liturgical calendar of the Coptic and Ethiopian churches.

Alongside the 365 day calendar, a lunar calendar was also used. Specialists are not in accord on how it functioned in detail (see below, chapters III. 6.10).

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[24] R. Weill, *CdE* 24/47 (1949), 13–18.

[25] R. A. Parker, RdE 9 (1952), 101–108.

[26] L. Depuydt, "On the Consistency of the Wandering Year as Backbone of Egyptian Chronology" *JARCE* 32 (1995), 43–58.

[27] Parker, *Calendars*, 39.

[28] It is left to the reader to figure that out.

Conversion of Dates

Astronomers reckon ancient astronomical events terms of the Julian, not the Gregorian calendar. The correlation between the Egyptian and the Julian calendars is implicit in Ptolemy's dating of astronomical observations according to the Egyptian calendar and to the 365 day Egyptian year of the so-called Ptolemaic Royal Canon which began with year 1 of the Babylonian king Nabonassar.[29] During the first years of the Era Nabonassar the correlation between the Egyptian and the corresponding Julian calendar dates was:

Royal Canon, year 1 : Thoth 1 = February 26, 747 BC

The Julian calendar year 745 BC was a leap year and so it follows that:

Royal Canon, year 4 : Thoth 1 = February 25, 744 BC
Royal Canon, year 8 : Thoth 1 = February 24, 740 BC

On this basis it is possible to convert any Egyptian date in a given or chosen year into the Julian calendar equivalent, with due consideration that the Julian calendar has a leap year and the Egyptian calendar does not. Tables for conversion have been constructed by Neugebauer.[30]

Egyptian Calendar Day

The word for calendar day used in dates was *sw*, not *hrw* (day as opposed to night).[31] Parker presented a circumstantial argument in favor of the beginning of the calendar day at dawn: "It is obvious that, when the [lunar] month begins, the first day of the month also begins."[32] Most Egyptologists accepted the validity of Parker's argument.[33] However, in the 1980s Leitz and Luft revived the arguments presented by Sethe in the 1920s that the calendar day began with sunrise.[34] They were

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[29] See below, Chapter III. 11.
[30] P. V. Neugebauer, *Astronomische Nachrichten*, No. 6261 (Kiel, 1937).
[31] Edel, *Grammatik*, 182.
[32] Parker, *Calendars*, 10.
[33] The validity of the argument was denied by Grzybek (n. 35), 142–143, who otherwise accepted the beginning of the calendar day at dawn.
[34] K. Sethe, "Die Zeitrechnung der alten Ägypter III", *NAWG* (1920), 130–138. U. Luft, *Altorientalische Forschungen* 14 (1987), 3–11; Leitz, *Studien*, 1–5.

countered by scholars like Grzybek, Spalinger and Wells who defended Parker's standpoint.[35]

Actually, August Böckh had solved the question in 1863 when he used Ptolemy's Almagest to demonstrate that the Egyptian calendar day began at dawn before sunrise.[36] In the Almagest Ptolemy twice recorded observations of Mercury, first with double dates:

Hadrian, year 18, Epiphi 18 to 19, at dawn;[37]
Antoninus, year 4, Phamenoth 18 to 19, at dawn.[38]

Subsequently, he gave single dates for the same observations:

Mercury as morning star: Hadrian, year 18, Epiphi 19[39]
Mercury as morning star: Antoninus, year 4, Phamenoth 19[40]

Mercury is only observable at dawn as morning star or at dusk as evening star. Ptolemy could have substituted single dates for double dates only if he reckoned dawn as the beginning of the Egyptian calendar days Epiphi 19 and Phamenoth 19. Accordingly, the Egyptian calendar day began during the observability of Mercury as morning star, i.e. at dawn before sunrise. Hieroglyphic sources also exist that imply the beginning of the calendar day at dawn—notably an entry in the Calendar of Lucky and Unlucky Days, describing the appearance of Seth in the bow of the solar bark which led Malinine to conclude that the calendar day began before sunrise, during *ḥḏ-tꜣ*.[41] The time when the god appeared at the bow of the solar bark, according to an entry in the Calendar of Lucky and Unlucky Days.[42] His argument is supported by the identification of the god Seth with planet Mercury here, rising shortly before the sun and thus visible at dawn.[43]

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[35] E. Grzybek, *Du calendrier macédonien au calendrier Ptolémaique* (Basel: SBA 20, 1990), 147–151; A. J. Spalinger, *OLZ* 87 (1982), 25; R. A. Wells, BiOr 49 (1992), 723.

[36] A. Böckh, *Über die vierjährigen Sonnenkreise der Alten, vorzüglich über den Eudoxischen*, (Berlin, 1863), 298–308.—Cf. R. Krauss, *SAK* 32 (2004), 275–286.

[37] J. G. Toomer, *Ptolemy's Almagest*, translated and annotated (Princeton, 1984), 449.

[38] Toomer (n. 37), 450.

[39] Toomer (n. 37), 456.

[40] Toomer (n. 37), 455–456.

[41] For ḥḏ-tꜣ as dawn, see K. Jansen-Winkeln, *SAK* 23 (1996), 201–202, and D. Kurth, *GM* 108 (1989), 34–35.

[42] M. Malinine, "Nouveaux fragments du calendrier égyptien des jours fastes et néfastes", in: *Mélanges Maspero* I, 2–3, Orient ancien (Cairo: *MIFAO* 66, 1935–1938), 887–888, 898.

[43] R. Krauss (n. 36), 284–285.—For Seth as planet Mercury see Neugebauer & Parker, *EAT* III, 180.

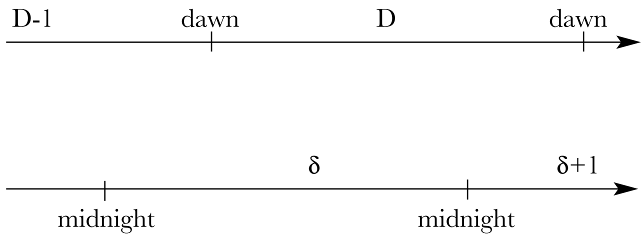


Fig. I. 5.1

Because an Egyptian calendar day (D) begins at dawn before sunrise, it overlaps two Julian calendar days (δ) and (δ + 1) that begin at midnight as Fig. I. 5.1 shows.

Neugebauer's tables yield δ as equivalent of D. The assertion that an Egyptian calendar day D equals the Julian calendar day δ, means that the bright part of D corresponds to the bright part of δ. It is implied that the early hours of δ are not contained in D, and that the last hours of D correspond to the first hours of the Julian calendar day (δ + 1).

PART II

RELATIVE CHRONOLOGY

II. 1 PREDYNASTIC—EARLY DYNASTIC CHRONOLOGY[1]

Stan Hendrickx

Introduction

There exists quite some confusion in the terminology used for the cultural phases and the relative chronology of Egypt during the 4th millennium, generally known as the Predynastic period. Already the term "Predynastic" in itself may cause a problem. Although it evidently refers to all periods previous to the dynastic history of Egypt, its use is in reality reserved for the Naqada culture of (Upper) Egypt which dates to the 4th millennium BC and economically represents a late Neolithic culture with increasing social complexity which is at the origin of the pharaonic civilisation. Most authors also call the preceding Badari culture "Predynastic", although it has also been considered "Neolithic", together with the 5th millennium finds from the Fayum, Merimde Beni Salama and el-Omari in LE.[2]

The terminology for the relative chronology of the Predynastic period is also far from consistent (Table II. 1.1). Originally Petrie distinguished three chronologically distinct cultures which he called respectively Amratian, Gerzean and Semainean, after type sites that he excavated.[3] By doing so he stressed the material differences, especially those between the Amratian and Gerzean which according to Petrie were caused by the arrival of a "new race". This view has already been abandoned for a long time, but the terms Amratian and Gerzean in particular continue to be used by some scholars up to the present day. It is however already a long time since the word "Naqada culture" has been used, divided in two or three phases (cf. below). This has the advantage of indicating the continuous development that took place during the 4th millennium BC.

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[1] I wish to thank Werner Kaiser, Edwin van den Brink, Nathalie Buchez and Christiana Köhler for comments and information on various aspects of the problems concerned with this contribution. Joanne Rowland most kindly perused the English.

[2] E.g. B. Midant-Reynes, *The Prehistory of Egypt. From the First Egyptians to the First Pharaohs* (London 2000).

[3] Petrie, Diospolis Parva; idem, *Prehistoric Egypt* (London 1920).

Table II. 1.1

Petrie 1920: 46–50 Brunton 1937, 1948 Vandier 1953	Scharff 1931: 16–30 Kantor 1944, 1965, 1993 Baumgartel 1970	Kaiser 1957, 1990	Hendrickx 1996, 1999	Hassan 1988
Semainean	Protodynastic	Naqada Stufe IIIa–c	Naqada IIIA–D	Terminal Predynastic
Gerzean	Naqada II	Naqada Stufe IIa–d	Naqada IIC–D	Late Predynastic
Amratian	Naqada I	Naqada Stufe Ia–c	Naqada I–IIB	Middle Predynastic
Badarian	Badarian	Badarian	Badarian	Early Predynastic

In LE the local 4th millennium culture identified at Maadi and Buto, for example has recently been the focus of research.[4] The original name "Maadi culture/Maadian" is still used at present,[5] but it has meanwhile also been termed "Buto-Maadi culture"[6] and "Maadi-Buto culture".[7] As up to now the site of Maadi has provided the largest amount of material available, it seems obvious that the terminology should stress the importance of that site. On the other hand, the position of "Buto" in the Maadi-Buto terminology indicates that the terminal stage(s) of this culture at Buto (and many other contemporary Delta sites) are no longer present at the key site of Maadi itself. On a more general level, it has been called "predynastic" because it is contemporaneous with part of the Naqada culture in UE,[8] but was also referred to as "chal-

[4] For recent overviews, see D. Faltings, "Ergebnisse der neuen Ausgrabungen in Buto. Chronologie und Fernbeziehungen der Buto-Maadi-Kultur neu überdacht", in: *Stationen*, 35–45; idem, "Recent Excavations in Tell El-Fara'in/Buto: New Finds and their Chronological Implications", in: Eyre, ed., *Proceedings*, 365–375; idem, "The Chronological Frame and Social Structure of Buto in the Fourth Millennium BCE", in: *Interrelations*, 165–170.

[5] E.g. Midant-Reynes (n. 2).

[6] E.g. K. Schmidt, "Comments to the Lithic Industry of the Buto-Maadi Culture in Lower Egypt", in: L. Krzyzaniak, M. Kobusiewicz & J. A. Alexander, eds., *Environmental Change and Human Culture in the Nile Basin and Northern Africa* (Poznan 1993), 267–277; J. Wunderlich, T. von der Way & K. Schmidt, "Neue Fundstellen der Buto-Maadi-Kultur bei Esbet el-Qerdahi", *MDAIK* 45 (1989), 309–318; Faltings, in: *Stationen*, 35–45.

[7] S. Hendrickx, "La chronologie de la préhistoire tardive et des débuts de l'histoire de l'Egypte", *Archéo-Nil* 9 (1999), 13–81; T. E. Levy & E. C. M. van den Brink, "Interaction Models, Egypt and the Levantine Periphery", in: *Interrelations*, 3–38.

[8] Midant-Reynes (n. 2).

colithic"[9] or "late prehistoric".[10] More exceptionally it has been termed "Early Bronze",[11] mainly for comparison with the Levant.

There is no obvious change in the material culture marking the transition between Predynastic and Early Dynastic in UE. Here one should distinguish between cultural chronology based on material evidence and the historical chronology based on written documents. The latter however are very exceptional outside of elite sites such as Abydos and Saqqara. Because of this, the end of the Naqada III culture is, from the archaeological point of view, to be placed within or at the end of Dyn. 2. The term Naqada culture will therefore also be used for the Early Dynastic period.

Tasian

A culture preceding the Badarian (cf. below) was originally identified by Brunton at Deir Tasa, and accordingly labelled by him as Tasian.[12] One of the main archaeological characteristics are narrow beakers with flaring rim and incised decoration. Subsequently, the Tasian has been discredited by Baumgartel as a separate cultural entity and was considered part of the Badarian.[13] This view has been accepted for a long time, but more recently Kaiser has considered the Tasian as an entity distinct from the Badarian.[14] For him, the Tasian represents the

[9] F.-J. De Cree, "'Mutatis Mutandis' Egyptian Relations with Palestine in the Chalcolithic and Early Bronze Age I–IV" *GM* 124 (1991), 21–42; K. Schmidt, "Tell el-Fara'in/Buto and el-Tell el-Iswid (south): The Lithic Industries from the Chalcolithic to the Early Old Kingdom", in: E. C. M. van den Brink, ed., *The Nile Delta in Transition: 4th.–3rd Millennium B.C.* (Jerusalem, 1992), 31–42; idem, "Lower and Upper Egypt in the Chalcolithic Period. Evidence of the Lithic Industries: A View from Buto", in: L. Krzyzaniak, K. Kroeper & M. Kobusiewicz, eds., *Interregional Contacts in the Later Prehistory of Northeastern Africa* (Poznan, 1996), 279–289; S. P. Tutundzic, "Chalcolithic Canaan and Egypt: Reinvestigations and Considerations", *Journal of the Serbian Archaeological Society* 12 (1996), 25–33.

[10] T. von der Way, *Untersuchungen zur Spätvor- und Frühgeschichte Unterägyptens* (Heidelberg: *SAGA* 8, 1993).

[11] A. R. Schulman, "At the Fringe: The Historiography and Historicity of the Relations of Egypt and Canaan in the Early Bronze Age I", in: P. R. de Miroschedji, ed., *L'urbanisation de la Palestine à l'âge du bronze ancien* (Oxford: *BAR* 527, 1989), 433–453.

[12] G. Brunton, *Mostagedda and the Tasian Culture* (London, 1937).

[13] E. J. Baumgartel, *The Cultures of Prehistoric Egypt I* (London, 1955), 20–21.

[14] W. Kaiser, "Zur Südausdehnung der vorgeschichtlichen Deltakulturen und zur frühen Entwicklung Oberägyptens", *MDAIK* 41 (1985), 61–88.

transmitter of LE elements to UE. However, this seems most unlikely because of the presence of beakers strongly resembling those of the Tasian in Sudanese neolithic contexts, for example at Kadero and Kadada, dated to late 5th–early 4th millennium cal. BC.[15] Most recently, Tasian beakers have also been published for the Eastern Desert.[16] In the Western Desert, Tasian burials have been identified in the Wadi el-Hol, on the desert road between Luxor and Farshut[17] and at Gebel Ramlah, near Nabta Playa.[18] The new evidence, together with a reinterpretation of older information, allows rather for the consideration of the Tasian as a desert phenomenon, which however also had extensive contacts with the Nile valley.[19] The finds from Wadi Attula in the Eastern Desert have been radiocarbon dated between 4940 and 4455 cal BC, a surprisingly early date.[20] These are the only dates available at present and although confirmation from other sites remains desirable, this indicates not only a cultural difference with the Badarian but eventually also a chronological. It is however to be noted that the finds from the Nile valley occurring in a Badarian context, indicate that the Tasian may have started before the Badarian, but was at least also partially contemporaneous with it.

Badarian

The Badari culture has originally been identified in the region of Badari (Qaw el-Kebir, Hammamiya,[21] Mostagedda[22] and Matmar),[23] where a number of small cemeteries, containing in total about 600 tombs, and

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[15] E.g. M. Chłodnicki, "New Types of the Neolithic Pottery in Kadero (Sudan)", *CRIPEL* 17,2 (1997), 29–35; J. Reinold, Kadruka and the Neolithic in the Northern Dongola Reach", *Sudan & Nubia* 5 (2001), 2–10.

[16] Friedman & Hobbs, "A 'Tasian' Tomb in Egypt's Eastern Desert", in: *Gifts*, 178–91.

[17] J. C. Darnell & D. Darnell, "Opening the Narrow Doors of the Desert: Discoveries of the Theban Desert Road Survey", in: *Gifts*, 132–155.

[18] M. Kobusiewicz, J. Kabacinski, R. Schild, J. D. Irish & F. Wendorf, "Discovery of the first Neolithic cemetery in Egypt's Western Desert", *Antiquity* 78 (2004), 566–578; R. Schild et al., "Gebel Ramlah Playa", in: *Tides of the Desert—Gezeiten der Wüste,* Jennerstrasse 8, eds., (Cologne, 2002), 117–23.

[19] Friedman & Hobbs (n. 16), 189.

[20] Friedman & Hobbs (n. 16), 178.

[21] G. Brunton & G. Caton Thompson, *The Badarian Civilisation and Prehistoric Remains near Badari* (London, 1928).

[22] Brunton (n. 12).

[23] G. Brunton, *Matmar* (London, 1948).

40 poorly documented settlement sites. However, characteristic Badarian finds have also been made much further to the south (Mahgar Dendera,[24] Armant,[25] Elkab,[26] and Hierakonpolis)[27] and also in the Wadi Hammamat.[28] Besides Mahgar Dendera most of these finds are unfortunately limited in extent. [29]

Until recently, most authors tended to consider the Badari culture as a chronologically separated unit, out of which the Naqada culture developed. However, the situation is certainly far more complex. Since more Badarian finds, or Badari related finds, have been made south of Badari, the Badari culture might well have been present between at least the Badari region and Hierakonpolis. Regional differences may have existed, the unit in the Badari region itself being the only well documented one up to now.

The chronological position of the Badari culture is still subject for discussion. Its relative position as being older than the Naqada culture has already for a long time been shown by the stratified site at Hammamiya.[30] From TL-dating, the culture might already have existed by 5000 cal BC. However, based on the available radiocarbon dates, only the period around 4400–4000 cal BC can be confirmed for certain.[31]

Additional information on the chronological position of the Badarian may be gained by searching for its origin. Recent investigations have shown strong links between the ceramic industry of the Badarian and the Bashendi B unit from the Dakhleh oasis, [32] and with the Late/Final Neolithic from the Nabta-Kiseiba area.[33] The Bashendi B culture can

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[24] S. Hendrickx, B. Midant-Reynes & W. Van Neer, *Mahgar Dendera 2 (Haute Egypte), un site d'occupation Badarien* (Leuven, 2001).

[25] O. H. Myers & H. W. Fairman, "Excavations at Armant 1929–1931", *JEA* 17 (1931), 228–229.

[26] P. M. Vermeersch, *Elkab II. L'Elkabien, Epipaléolithique de la Vallée du Nil Egyptien* (Leuven, 1978), 139–143.

[27] M. A. Hoffman, "A Preliminary Report on 1984 Excavations at Hierakonpolis", *NARCE* 132 (1986), 3–14.

[28] F. Debono, "Expéditon archéologique royale au désert oriental (Keft—Kosseir): Rapport préliminaire sur la campagne 1949", *ASAE* 51 (1951), 74.

[29] For a more detailed overview of Badarian sites, see S. Hendrickx & E. C. M. van den Brink, "Inventory of Predynastic and Early Dynastic Cemetery and Settlement Sites in the Egyptian Nile Valley", in: *Interrelations*, 346–399.

[30] Brunton & Caton Thompson (n. 21), 73–8; D. L. Holmes & R. F. Friedman, "Survey and Test Excavations in the Badari Region, Egypt", *PPS* 60 (1994), 105–142.

[31] Hendrickx (n. 7), 19.

[32] C. A. Hope, "Early and Mid-Holocene Ceramics from the Dakhleh Oasis: Traditions and Influences", in: *Gifts*, 39–61.

[33] See especially site E-75–8, K. Nelson, "Ceramic Assemblages of the Nabta-Kiseiba

be dated between 5650/5400 and 3950 cal BC,[34] and the Late/Final Neolithic at site E-75–8, roughly between 5500 and 4700 cal BC. From these dates a very early start for the Badarian seems distinctly possible, contrarily to the opinion of the present author expressed only a few years ago.[35] Nevertheless it remains a fact that a duration of a thousand years or even more for the Badarian does not seem to be supported by the limited number of cemeteries and tombs known in the Badari region, where research is supposed to have been as exhaustive as possible. If originally based in its present desert regions, the Badarians might only at a later stage have used the Nile valley for permanent living.

Naqada Culture—History of Research—Petrie's Sequence Dating

In 1895 a huge cemetery of previously unknown type was discovered by W. M. F. Petrie at Naqada.[36] At first it was thought to date from the FIP, but Jacques de Morgan soon realised the prehistoric nature of the cemetery,[37] which was later confirmed as "predynastic" by Petrie. A number of important similar cemeteries were excavated in UE during the beginning of the last century. The original study on the relative chronology of the Naqada culture goes back to the early years of the 20th century, when Petrie worked out his Sequence Dating,[38] the first attempt at what is now known as seriation. The history of this remarkable relative chronology has in recent years already been presented and discussed many times[39] and will only be presented briefly here.

Area", in: K. Nelson & Associates, *Holocene Settlement of the Egyptian Sahara. Volume 2. The Pottery of Nabta Playa* (New York—Boston—Dordrecht, 2002), 34–35.

[34] M. M. A. McDonald, "The Late Prehistoric radiocarbon Chronology for Dakhleh Oasis within the wider environmental and cultural Setting of the Egyptian Western Desert", in: C. A. Marlow & A. J. Mills, eds., *The Oasis Papers 1: The Proceedings of the First Conference of the Dakhleh Oasis Project* (Oxford, 2001), 26–42; idem, "Dakhleh Oasis in Predynastic and Early Dynastic Times: Bashendi B and the Sheikh Muftah Cultural Units", *Archéo-Nil* 12 (2002), 109–120.

[35] Hendrickx (n. 7), 19.

[36] W. M. F. Petrie & J. E. Quibell, *Naqada and Ballas* (London, 1896); E. J. Baumgartel, *Petrie's Naqada Excavation: A Supplement* (London, 1970).

[37] J. de Morgan, *Recherches sur les origines de l'Egypte. I. L'age de la pierre et des métaux* (Paris, 1896).

[38] W. M. F. Petrie, "Sequences in Prehistoric Remains", *JRAI* 29 (1899), 295–301; idem (n. 3), *Diospolis Parva*, 4–12; idem, *Prehistoric Egypt* (n. 3), 3–4.

[39] J. C. Payne, "The Chronology of Predynastic Egyptian Decorated Ware", *Eretz-*

The Sequence Dating is based on the grave goods from the cemeteries excavated by Petrie and his assistants at Naqada, Ballas[40] and Diospolis Parva.[41] As a first step, the pottery was arranged in a corpus of "predynastic" pottery, consisting of nine classes of pottery and over 700 types (Table II. 1.2).[42] Next, all of the objects from each grave were noted on a slip of card. Finally, the cards were arranged in a relative chronological order based on the resemblance of types. In this stage of his work, Petrie used only 900 relatively intact graves containing five or more different pottery types, out of over 4000 excavated graves. The chronological order was defined by two main principles. Firstly, an earlier and a later phase were distinguished through the observation that the classes of White Cross-lined pottery on one hand, and Decorated and Wavy Handled pottery on the other hand, hardly ever occurred together. Secondly, it was accepted that there had been an evolution of the shape of the Wavy Handled types, going from globular to cylindrical shapes, while at the same time the handles had changed from two functional handles to a continuous decorative line.[43]

Table II. 1.2. Pottery Classes Distinguished by W. M. F. Petrie, *Corpus of Prehistoric Pottery and Palettes* (London, 1921) and Their Characteristics

Class		Defined by	Class relations	Fabric
Black-Topped	B	Firing technology		Nile silt
Red-Polished	P	Surface treatment		Nile silt
Fancy	F	Shape	mainly Red-Polished	mainly Nile silt
White Cross-Lined	C	Decoration	Red-Polished	Nile silt
Incised Black	N	Decoration		Nile silt
Decorated	D	Decoration	mainly Late	Marl clay
Wavy-Handled	W	Morphological detail		Marl clay
Rough	R	Fabric/surface treatment		Nile silt, organic temper
Late	L	Fabric/chronology	some Rough	mainly Marl clay

Israel 21 (1990), 77–82; D. C. Patch, *The Origin and Early Development of Urbanism in Ancient Egypt: A Regional Study*, U.M.I. (Ann Arbor / Pennsylvania, 1991), 153–170; B. Midant-Reynes, *Préhistoire de l'Egypte. Des premiers hommes aux premiers pharaons* (Paris, 1992), 240–243; idem (n. 2), 257–259; B. Adams, *Ancient Nekhen. Garstang in the City of Hierakonpolis* (New Malden, 1995), 21–26; T. A. H. Wilkinson, *State Formation in Egypt. Chronology and Society* (BAR 651, Oxford, 1996), 9–11; S. Hendrickx, "The Relative Chronology of the Naqada Culture: Problems and Possibilities", in: A. J. Spencer, ed., *Aspects of Early Egypt* (London, 1996), 36–43; idem (n. 7), 20–25.

[40] Petrie & Quibell (n. 36).

[41] Petrie (n. 3), *Diospolis Parva*.

[42] W. M. F. Petrie, *Corpus of Prehistoric Pottery and Palettes* (London, 1921).

[43] Cf. Petrie (n. 3), *Diospolis Parva*, pl. II; B. Adams, Predynastic Egypt (Aylesbury, 1988), 27; Hendrickx (n. 7), 31, fig. 9.

This evolution was corroborated by the fact that the "early" and "late" Wavy Handled types did not occur in the same tomb. In addition, the "late" Wavy Handled types and an important number of types from the Late class occurred in tombs which could be dated by inscriptions to Dyn. 0 or 1.

When all of the grave cards had been arranged in order, Petrie divided the cards into fifty equal groups, each of them consisting of 18 graves, numbering them as Sequence Dates from thirty to eighty. By choosing to start at SD 30, he left space for earlier cultures, which he thought were still to be discovered.[44] Finally the fifty sequence dates were divided into three groups which he considered to be archaeologically, culturally and chronologically different. The "cultures" were named Amratian (SD 30–37), Gerzean (SD 38–60) and Semainean (SD 60–75), after important predynastic cemetery sites.

The Sequence Dates were continued with a second typological corpus, for the "protodynastic" pottery.[45] This is almost exclusively based on material from the extensive cemeteries at Tarkhan.[46] This time the number of types reached 885 and no classes of pottery were distinguished, which makes the corpus in some cases difficult to use. The "protodynastic" corpus partially overlaps with the most recent types of the "predynastic" corpus, as a result of which the Sequence Dates for the "protodynastic" corpus start already from SD 76 and continue to SD 86, which should mark the beginning of Dyn. 3. However, the SDs 83–86 remained almost completely theoretical because of the lack of Dyn. 2 material at Tarkhan. The distinction between the individual Sequence Dates is not carried out in the way in which it was done for the "predynastic" corpus. This time, however, the transition to a new SD is based on typological breaks which Petrie defined mainly through the development of the Wavy Handled types. Finally, Petrie connected the Sequence Dating with the historically dated pottery types and other objects from the royal tombs of the earliest dynasties at Abydos.[47]

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[44] When he discovered the Badarian, Brunton tried to apply Sequence Dating (Brunton & Caton Thompson (n. 21), 26; Brunton (n. 12), 50–51), but this was from the beginning considered problematic and never found its way into the scientific literature.

[45] W. M. F. Petrie, *Corpus of Proto-Dynastic Pottery* (London, 1953).

[46] W. M. F. Petrie, *Tarkhan I and Memphis V* (London, 1913); idem, *Tarkhan II* (London, 1914).

[47] Petrie (n. 46), *Tarkhan I and Memphis V*, 3.

The development of the Sequence Dates certainly represents one of the major intellectual performances in the study of predynastic Egypt, and most of the basic observations by Petrie, such as the evolution of the Wavy Handled types, were never contradicted. Nevertheless, a number of methodological shortcuts and possible errors concerning the practical elaboration of the Sequence Dates were subsequently pointed out by several authors.[48] Petrie makes no clear distinction between typology and chronology. This, for example, is obvious from the heterogeneous manner by which his pottery classes have been defined (cf. Table II. 1.2). Furthermore, the definition of the individual types within these classes is not bound by strict rules.[49] Even more important is the fact that Petrie only included tombs with five or more objects, resulting in the under-representation of the earlier period.[50] The lack of attention to eventual regional differences is also to be noted.

The most striking omission in Petrie's manner of working remains that he never took the horizontal distribution of the graves into consideration. This, despite the fact that he noted for instance that none of the cemeteries from Diospolis Parva covered the whole of the SDs, but that "early" and "late" cemeteries could be distinguished.[51] Strangely enough, Petrie does not mention spatial distribution within the cemeteries of Naqada, Ballas or Diospolis Parva, although it is hardly imaginable that he did not notice any clustering of tombs with similar funerary equipment. On the occasion of later excavations, by former assistants of Petrie, the existence of groups of chronologically related graves, and therefore the differences in the spatial distribution of objects, were noticed several times and at different sites,[52] but no attempts were made to use these observations for chronological purposes.

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[48] G. F. Legge, "New Light on Sequence-dating", *PSBA* 35 (1913), 101–113; A. Scharff, *Das vorgeschichtliche Gräberfeld von Abusir el-Meleq* (Leipzig, 1926), 71–74; H. J. Kantor, "The Final Phase of Predynastic Culture, Gerzean of Semainean?", *JNES* 3 (1944), 110–136; Baumgartel (n. 13), 2; idem, *Predynastic Egypt* (CAH I, IXa, London, 1970), 3–5; W. Kaiser, "Stand und Probleme der ägyptische Vorgeschichtsforschung", *ZÄS* 81 (1956), 87–109; Hendrickx (n. 39), 37–38; idem (n. 7), 21–22.

[49] Petrie (n. 42), 5.

[50] Hendrickx (n. 39), 37.

[51] Petrie (n. 3), *Diospolis Parva*, 31–32.

[52] D. Randall-McIver & A. C. Mace, *El Amrah and Abydos. 1899–1901* (London, 1902), 3; E. R. Ayrton & W. L. S. Loat, *Pre-dynastic Cemetery at El-Mahasna* (London, 1911), 2; T. E. Peet, *The Cemeteries of Abydos. Part II. 1911–1912* (London, 1914), 18; Brunton & Caton Thompson (n. 21), 50–1.

Finally, Petrie's wish for a very detailed relative chronology in 50 Sequence Dates causes a fundamental problem. As a basic principle, the definition of the original Sequence Dates was made in a manner so as to minimise the chronological dispersion of each type of pottery. This results in a compromise between the competing claims of all pottery types for closer proximity. However, the "perfect balance" obtained by Petrie is purely artificial, since, whenever new graves will be added to the system, the range of Sequence Dates for a number of types will have to be expanded, and the accuracy suggested by the Sequence Dating system becomes purely hypothetical. The integration of new cemeteries over time made the whole system more and more problematic.

Kaiser's Stufen *Chronology*

W. Kaiser was the first to reinvestigate the relative chronology of the predynastic period in a fundamental manner.[53] He used the horizontal distribution of pottery classes and types of objects within cemetery 1400–1500 at Armant as point of departure.[54] Three spatial zones were distinguished by the relative percentages of Black-Topped, Rough and Late Wares, each of them dominating one zone. These zones are considered to represent chronological stages. Within these three periods, subdivisions, called *Stufen*, were recognised according to the clustering of types of objects, these being almost exclusively pottery. The results of the analysis of the Armant cemetery are completed with a limited investigation of cemeteries for which the publication was less detailed, but where pottery types occur which are not represented at Armant. In this manner Kaiser distinguished three main stages of the development of the Naqada culture, each with their subdivisions. All in all, 11 *Stufen* are identified, the two earliest and the two most recent of which are not represented at Armant. The archaeological description of the *Stufen* is based on types of objects, according to the Petrie typology, which Kaiser accepts as characteristic for a particular *Stufe*. Material from cemeteries other than Armant is also included. The characteristics of the *Stufen* are also used by Kaiser to study the geographical distribution of the Naqada culture. The chronological expansion which can

[53] W. Kaiser, "Zur inneren Chronologie der Naqadakultur", *Archaeologia Geographica* 6 (1957), 69–77.
[54] R. L. Mond & O. H. Myers, *Cemeteries of Armant I* (London, 1937).

Table II. 1.3. Correlation between Petrie's Sequence Dating and Kaiser's Stufen

Kaiser	SD	Petrie	SD
Zeitstufe III	SD 63–80	Semainean	SD 63–76
Zeitstufe IIcd	SD 40/45–63	Gerzean	SD 38–62
Zeitstufe IIab	SD 38–40/45		
Zeitstufe I	SD 30–38	Amratian	SD 31–37

be observed from UE both towards the north and the south, is considered further proof of the validity of the *Stufen* chronology.

The *Stufen* have also been compared with the Sequence Dating.[55] Although Kaiser defined three main periods, the SD's attributed to them show that they are largely, but not completely, identical to the Amratian, Gerzean and Semainean distinguished by Petrie (Table II. 1.3). When compared to the Sequence Dating, Kaiser's system has the advantage of including not only information from the typological apparatus, but also from the spatial distribution of the objects. Furthermore it does not give the idea of extreme accuracy, but by defining periods, it escapes largely, although not completely, the problem of becoming increasingly meaningless when new data are added.

However, this does not mean that the *Stufen* system is without its problems. Although Kaiser included data from a number of cemeteries besides the one at Armant, it remains a basic fact that data from only a single cemetery are used for the description of the Naqada culture throughout UE. Nevertheless, Kaiser is well aware of the possibilities for regional differentiation, and has noticed regional phenomenon at Mahasna for instance.[56] The problem caused by using the cemetery at Armant becomes even more complicated because the earliest phase of the Naqada culture is not present at Armant, and even the most recent phases are very sparsely documented or absent. Therefore, the definition of the *Stufen* Ia and Ib is merely based on hypothesis, although examples from other cemeteries besides Armant are given. The description of *Stufe* IIIb, though less hypothetical than *Stufen* Ia and Ib, is also based on information from other cemeteries. In most cases it was not possible to study the spatial development of these cemeteries, and therefore Kaiser's description of the *Stufen* Ia–b and IIIb depends largely on

[55] Kaiser (n. 48), 109.
[56] Kaiser (n. 53), 74.

the theoretical evolution of pottery types, especially from the Wavy-Handled class as already accepted by Petrie.

A very practical problem is that Kaiser's study was only published in abridged version as an article. Because of spatial considerations within the publication, Kaiser was unable to provide details on his analytical method. The plates illustrating the article visualise the description of the *Stufen* by presenting for each of them the most important and characteristic types of objects.[57] Unfortunately these plates have been used by some as absolute guidelines, despite the fact that the plates are only intended to be considered as an idealised outline of the development of the *Stufen*. This created a false idea of secure dating, especially for the *Stufen* IIIa–b. More recently Kaiser mentioned in an article the extension of his *Stufen* chronology into Dyn.1.[58] However, the manner in which this was done remains until now unpublished. The extension was nevertheless used by several authors.

Kaiser's distinction of three phases within the Naqada culture reflects Petrie's original division. At first view there seems to be no problem because several cemeteries belonging to the Naqada culture bear evidence for the presence of three groups of graves, dominated respectively by the presence of Black-Topped, Rough and Late/Wavy Handled pottery. The moment at which the transitions are placed is however not beyond dispute. This and other more specific problems concerning the *Stufen* chronology will be discussed when the individual subdivisions of the Naqada culture are presented.

Computer Seriation

Computer seriation has also been applied on predynastic cemeteries to study their relative chronology. A pioneer attempt made by E. M. Wilkinson is at present only of historical interest.[59] Far more important is Kemp's seriation by multi-dimensional scaling of the graves within cemetery B at el-Amrah and the cemetery of el-Mahasna.[60] However,

[57] Kaiser (n. 53), Pl. 21–24.

[58] W. Kaiser, "Zur Entstehung des gesamtägyptischen Staates", *MDAIK* 46 (1990), Abb. 1.

[59] E. M. Wilkinson, "Techniques of Data Analysis. Seriation Theory", *Technische und Naturwissenschaftliche Beiträge zur Feldarchäologie. Archaeo-Physika* 5 (1974), 1–134.

[60] B. J. Kemp, "Automatic Analysis of Predynastic Cemeteries: A New Method for an Old Problem", *JEA* 68 (1982), 5–15.

this seriation is not used for the evaluation of Kaiser's *Stufen* chronology, but for Petrie's Sequence Dating.

A far more elaborate study of the relative chronology using seriation has been made by T. A. H. Wilkinson.[61] Eight Predynastic—Early Dynastic cemeteries were seriated.[62] For this purpose, 1420 out of 1542 types from Petrie's corpus which occurred in the eight cemeteries were condensed into 141 groups.[63] This approach, of course, carries the risk of producing strongly heterogeneous types, and as Wilkinson himself notes, some of his groups "bring together types with broad similarities but some significant differences".[64] There are indeed problems with the majority of the newly defined groups, especially for the plates, cups and bowls (P 001, P 004, P 033, P 034 etc.). Among the most notable difficulties is the grouping of Nile silt and marl clay bowls and even the very characteristic Nile silt bread moulds in the groups P 094, P 095 and P 103. Several groups of jars are also very heterogeneous (e.g. P 013, P 019, P 029, P 128, P131, P138). One can also question the validity of distinguishing two groups of wine jars (P 107 and P 108) by the broadness of their shoulders, while very distinctive elements such as the applied ridges and the wavy decorations are completely ignored. Furthermore, it is difficult to understand why in group P 052 cylindrical jars both with and without incised decoration have been grouped. This is all the more disturbing because this element has been used as a chronological indicator by Kaiser for the development of his *Stufen* chronology. It is obvious that the manner in which Petrie's types have been grouped, makes it impossible to arrive at the same results as those which Kaiser obtained for his *Stufen* chronology.

The inevitable conclusion is that when Petrie's types are grouped into only 141 new groups, these become heterogeneous to a degree no longer consistent with the concept "type". While this does not render Wilkinson's seriations totally meaningless, the many anomalies involved introduce a disturbing element of uncertainty in the results.[65] Whenever

[61] T. A. H. Wilkinson, "A New Comparative Chronology for the Predynastic—Early Dynastic Transition", *JACF* 7 (1994–1995), 5–26; idem (n. 39).

[62] Tarkhan Hill and Valley Cemeteries, Turah, Matmar Cemeteries 200/3000–3100/5100, Mostagedda Cemetery 1600–1800, Mahasna, el-Amrah Cemetery b, Armant Cemetery 1400–1500, Hierakonpolis Fort Cemetery.

[63] Wilkinson (n. 39), 25.

[64] Wilkinson (n. 39), 23.

[65] For a more extensive discussion of Wilkinson, *State Formation in Egypt* (n. 39), see the review by S. Hendrickx in *JEA* 85 (1999), 241–245.

possible, the result of the seriations has also been plotted on a plan of the cemetery, to facilitate discussion of the chronological development of the cemeteries involved. The horizontal distribution of graves and pottery types is, however, only used as a method of control and not as a primary source of information. The use of a general typology for all eight cemeteries allowed Wilkinson direct comparison of the seriation results. Each sequence distinguished was compared against Kaiser's *Stufen* chronology. Significant differences emerged, most notably in Kaiser's demarcation of the three major Naqada culture phases.

Distribution Studies

A number of studies on the relative chronology of the Naqada period have started from the spatial distribution of objects within the cemeteries rather than from seriation. Once more, the problem of grouping types, which was the main problem for seriation, will occur, albeit to a lesser extent. The first study of this kind concerns an unpublished M.A. thesis by R. Friedman on the spatial distribution and relative chronology at Naqa ed-Deir cemetery 7000.[66] Comparison is made with Kaiser's *Stufen* chronology. Spatially distinguished groups of graves with objects characteristic for the *Stufen* Ic–IId are also represented at Naqa ed-Deir, but some differences in the characteristic pottery types for the individual *Stufen* have also been observed.

J. C. Payne applied Kaiser's chronology to the available information for the Main Cemetery at Naqada.[67] She concludes that the same *Stufen* can be distinguished both at Armant and at Naqada and also that the differences in the archaeological description of the *Stufen* remain very limited, the most important being situated in *Stufe* IIb.[68]

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[66] R. F. Friedman, *Spatial Distribution in a Predynastic Cemetery: Naqa ed Dêr 7000* (unpubl. MA. diss., Berkeley, 1981). The chronological framework established by Friedman was afterwards used by S. H. Savage, *Descent, Power and Competition in Predynastic Egypt: Mortuary Evidence from Cemetery N 7000 at Naga-ed-Dêr* (U.M.I., Ann Arbor/Arizona State University, 1995); idem, "Descent Group Competition and Economic Strategies in Predynastic Egypt", *JAnAr* 16 (1997), 226–68. For the latter study see however P. Delrue, "The Predynastic Cemetery N7000 at Naga ed-Dêr. A Re-evaluation", in: H. Willems, ed., *Social Aspects of Funerary Culture in the Egyptian Old and Middle Kingdoms* (Leuven, 2001), 21–66.

[67] J. C. Payne (n. 39), 77–82; idem, "Predynastic Chronology at Naqada", in: R. F. Friedman & B. Adams, eds., *The Followers of Horus. Studies Dedicated to Michael Allen Hoffman* (Oxford, 1992), 185–192.

[68] Payne (n. 39), 81.

The most extensive study based on spatial distribution is a still incompletely published Ph.D. dissertation by the present author.[69] The limited number of "Predynastic" cemeteries for which both a map and a grave register, be it eventually incomplete, are available served as a starting point.[70] For the Early Dynastic period information came from a number of "Protodynastic" and "Archaic" cemeteries in LE.[71] Methodologically, there is not much difference to the method already developed by Kaiser. This implies that the distinction of related groups of graves is not only based on their contents but at the same time on their spatial distribution within the cemetery. As a result, a conflict of interests will arise between the search for closer chronological proximity of all examples of one pottery type on one hand, and the definition of spatially well defined groups of graves on the other hand. Neither one of these two

[69] S. Hendrickx, *De grafvelden der Naqada-cultuur in Zuid-Egypte, met bijzondere aandacht voor het Naqada III grafveld te Elkab. Interne chronologie en sociale differentiatie* (unpubl. PhD. diss., Leuven, 1989); idem (n. 39); idem (n. 7).

[70] The following cemeteries, from north to south, are involved: Matmar, cemetery 2600–2700 [Brunton (n. 23), pl. VIII–IX, XIX], el Badari, cemeteries 3700 and 3800 [Brunton & Caton-Thompson (n. 21), pl. III, XXXII–XXXIII], Hammamiya, cemetery 1500–1800 [G. Brunton, *Qau and Badari I* (London, 1927), pl. VI, X–XI; Brunton & Caton-Thompson (n. 21), pl. XXX–XXXI]; Qaw el-Kebir, cemetery 100 [idem, pl. III, XXX], el-Salmany [A. el Sayed, "A Prehistoric Cemetery in the Abydos Area", *MDAIK* 35 (1979), 249–301], Naqada Main Cemetery [Petrie & Quibell (n. 36), pl. LXXXII–LXXXIII; Baumgartel *Petrie's Naqada Excavation: A Supplement*; S. Hendrickx, "Predynastische objecten uit Naqada en Diospolis Parva (Boven-Egypte)", *Bulletin van de Koninklijke Musea voor Kunst en Geschiedenis* 57 (1986), 31–44; J. C. Payne, "Appendix to Naqada Excavations Supplement", *JEA* 73 (1987), 181–190], Armant cemeteries 1300 and 1400–1500 [Mond & Myers, n. 54], Hierakonpolis, locality 27, 'Fort Cemetery' [B. Adams, *The Fort Cemetery at Hierakonpolis* (London—New York, 1987)], Elkab [S. Hendrickx, *Elkab V. The Naqada III Cemetery* (Brussels, 1994)], Kubbaniya, South cemetery [H. Junker, *Bericht über die Grabungen von der Akadamie der Wissenschaften in Wien, auf den Friedhöfen von El Kubanieh—Sud. 1910–1911* (Wien, 1919)].

[71] The following cemeteries, from north to south, are involved: Abu Roash, cemeteries 0, 300, 400–500, 800–900 & M [A. Klasens, "The Excavations of the Leiden Museum of Antiquities at Abu-Roash. Report of the First Season: 1957. Part I", *OMRO* 38 (1957), 58–68; idem, "The Excavations of the Leiden Museum of Antiquities at Abu-Roash: Report of the First Season 1957. Part II", *OMRO* 39 (1958), 20–31; idem, "The Excavations of the Leiden Museum of Antiquities at Abu-Roash: Report of the Second Season 1958. Part I", *OMRO* 39 (1958), 32–55; idem, "The Excavations of the Leiden Museum of Antiquities at Abu-Roash: Report of the Second Season 1958. Part II. Cemetery 400", *OMRO* 40 (1959), 41–61, idem, "The Excavations of the Leiden Museum of Antiquites at Abu-Roash: Report of the Third Season 1959. Part I", *OMRO* 41 (1960), 69–94; idem, "The Excavations of the Leiden Museum of Antiquities at Abu-Roach: Report of the Third Season 1959. Part II. Cemetery M", *OMRO* 42 (1961), 108–28], Saqqara, cemetery west of Serapeum [R. Macramallah, *Un cimetière archaïque de la classe moyenne du peuple à Saqqarah* (Le Caire, 1940)], Turah [Junker, *Turah*], Tarkhan, Valley cemetery, cemeteries A, F, G, H, J & Q [Petrie (n. 46), *Tarkhan I*; idem (n. 46), *Tarkhan II*].

elements can be accepted as prevailing over the other. Thus, most unfortunately, it seems impossible to establish clearly defined, "objective" rules for the definition of archaeological complexes representing relative chronological periods within the Naqada culture. This implies that although a relative chronology defined in this manner is of course based on the seriation principle, it nevertheless depends considerably on the personal interpretation of the researcher.

Most cemeteries of the Naqada culture were used over several centuries, during which they expanded horizontally, but not in a premeditated manner. For the Naqada I–II period in particular this results in cemeteries consisting of "patches" of simultaneous tombs, as can be shown for the cemetery at Adaïma for example.[72] During the Naqada III period, the cemeteries tend to develop in a more linear manner, as can be seen at Elkab[73] and Tura.[74] By comparing the cemeteries that were analysed, it becomes clear that similar groups exist for different cemeteries. In this manner, 11 groups of graves, an equal number to Kaiser's *Stufen*, are distinguished and their relative chronological order defined through their mutual position in the cemeteries, and through the evolution of the pottery classes and types of objects. However, comparing groups of related objects from geographically different cemeteries does not have to imply that they are also contemporaneous in absolute chronological terms. Unfortunately, this question cannot be answered because of the limited number of C14 dates available for the Naqada cemeteries from UE. For this reason, and since related groups of archaeological objects can be distinguished at several sites, until proven otherwise, we may as well accept the simultaneity of archaeological groups with a strong resemblance, suggesting that the same chronological periods may well have existed for the different cemeteries.

In a further stage, the data from cemeteries without published maps were integrated and the possibilities of regional variability investigated. This eventually allows for an archaeological description of each of the relative chronological periods. The general observations made by Kaiser for cemetery 1400–1500 at Armant are not fundamentally contradicted,

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[72] E. Crubézy, T. Janin & B. Midant-Reynes, *Adaïma II. La nécropole prédynastique* (Le Caire, 2002), 415–417.

[73] Hendrickx (n. 70, Elkab V), 205–216.

[74] Hendrickx (n. 39), 57–59.

and therefore the number of relative chronological periods is equal to the number of *Stufen* distinguished by Kaiser, although in some cases important differences occur in their archaeological description (cf. below). It was therefore decided to follow Kaiser's work as closely as possible, but to replace the word "*Stufe*" by "Naqada" and at the same time change the letter indication into capital letters, which results in "Naqada IA" etc.[75]

Description of Naqada Periods—Naqada I

The descriptions presented here are mainly based on the distribution studies made for a number of cemeteries for which both a map and tomb inventory are available.[76] Only the main developments and most characteristic types of objects are mentioned (cf. Table II. 1. 4a–b). Although the archaeological characteristics of the Badarian are strongly related to those of the early Naqada I period, it is nevertheless to be noted that at present no cemeteries are known which show a continuous use from the Badarian into the Naqada period. The burials are however of the same type and organised in the same manner. The differences are mainly to be found in the material culture, for which the pottery presents the most obvious evidence. Not only will the characteristic rippled surface of the Badarian only occur most exceptionally during Naqada IA, but more importantly, the three principal pottery fabrics of the Badarian differ from those of the Naqada culture.[77] Naqada I sites occur only in UE, from the Badarian region in the north to a few sites south of Aswan, in Lower Nubia. All of the Naqada I period is dominated by Black-Topped pottery, which makes up over 50% of the assemblage. Red-Polished and White Cross-Lined are the second most important categories.

[75] Cf. Levy & van den Brink, in: *Interrelations*, 9.

[76] Hendrickx (n. 69); see notes 70–71. For a more detailed overview of the relative chronological periods represented at individual Naqada sites, see Hendrickx & van den Brink, in: *Interrelations*, 346–399.

[77] R. F. Friedman, *Predynastic Settlement Ceramics of Upper Egypt: A Comparative Study of the Ceramics of Hemamieh, Nagada and Hierakonpolis* (U.M.I., Ann Arbor / Berkeley, 1994).

Table II. 1.4a. Chronological evolution of Predynastic—Early Dynastic types of objects (Hendrickx, n. 69). Included are: Predynastic typology: Abydos cem. E., U, X, Φ, Frankfort; el-Ahaiwa; el-Amrah cem. A, B; el-Badari cem. 3600, 3700, 3800, 3900, 4000, 4600; Elkab; Hammamiya cem. 1500–1800, 1900–2000; el-Mahasna; Matmar cem. 200, 2600–2700, 3000–3100, 5100; Mesaid; Mustagedda cem. 200, 300, 400, 1200, 1600–1800, 4000, 5200, 10000, 11700; Qaw cem. 0, 100, 200; Salmany. Protodynastic typology: Badari cem. 3100, 3200, 5500, 6000; Hammamiya cem. 1600–1800, 2000; Matmar cem. 200, 600, 900–1000, 2000; Mustagedda cem. 1600–1800; Qaw cem. 400–500, 600, 700, 800; Tarkhan Hill and Valley Cemeteries; Turah. The cemeteries from Naqada have been excluded because of the incomplete data set that would distort the general overview.

	IA	IB	IC	IIA	IIB	IIC	IID1	IID2	IIIA1	IIIA2	IIIB	IIIC1	IIIC2	IIID	?	total
B	16	68	224	217	256	159	38	30	–	–	1	–	–	–	38	1047
C	4	7	30	6	–	–	–	–	–	–	–	–	–	–	2	49
N	–	–	–	1	1	–	1	–	–	–	–	–	–	–	–	3
F	1	2	22	20	24	30	5	1	3	1	–	–	–	–	10	119
P	2	18	73	53	69	231	119	107	15	3	2	–	–	–	35	727
D	–	–	1	1	15	104	58	21	16	9	5	–	–	–	11	241
R	–	1	16	56	252	715	385	432	218	352	232	50	77	30	121	2937
L	–	–	1	1	12	55	50	99	141	873	798	221	905	177	66	3399
W	–	–	–	–	–	49	29	112	66	1096	872	146	71	–	6	2447
stone	1	2	10	12	3	20	16	12	3	124	190	37	442	45	27	944
palet	–	1	37	21	27	41	25	19	13	158	105	22	4	–	52	525
flint	–	1	9	2	10	18	1	8	1	5	2	–	5	1	20	83
total	24	100	423	390	669	1422	727	841	476	2621	2207	476	1504	253	388	12521
# tombs	11	45	121	115	170	264	118	145	81	608	448	109	267	73	225	2761
average	2,18	2,22	3,49	3,39	3,93	5,38	6,16	5,80	5,88	4,31	4,93	4,36	5,63	3,46	1,72	4,53

Table II. 1.4b

	IA	IB	IC	IIA	IIB	IIC	IID1	IID2	IIIA1	IIIA2	IIIB	IIIC1	IIIC2	IIID	?	total
B	66,7	68,0	53,0	55,6	38,3	11,2	5,2	3,6	–	–	0,0	–	–	–	9,8	8,4
C	16,7	7,0	7,1	1,5	–	–	–	–	–	–	–	–	–	–	0,5	0,4
N	–	–	–	0,3	0,1	–	0,1	–	–	–	–	–	–	–	–	0,0
F	4,2	2,0	5,2	5,1	3,6	2,1	0,7	0,1	0,6	0,0	–	–	–	–	2,6	1,0
P	8,3	18,0	17,3	13,6	10,3	16,2	16,4	12,7	3,2	0,1	0,1	–	–	–	9,0	5,8
D	–	–	0,2	0,3	2,2	7,3	8,0	2,5	3,4	0,3	0,2	–	–	–	2,8	1,9
R	–	1,0	3,8	14,4	37,7	50,3	53,0	51,4	45,8	13,4	10,5	10,5	5,1	11,9	31,2	23,5
L	–	–	0,2	0,3	1,8	3,9	6,9	11,8	29,6	33,3	36,2	46,4	60,2	70,0	17,0	27,1
W	–	–	–	–	–	3,4	4,0	13,3	13,9	41,8	39,5	30,7	4,7	–	1,5	19,5
stone	4,2	2,0	2,4	3,1	0,4	1,4	2,2	1,4	0,6	4,7	8,6	7,8	29,4	17,8	7,0	7,5
palet	–	1,0	8,7	5,4	4,0	2,9	3,4	2,3	2,7	6,0	4,8	4,6	0,3	–	13,4	4,2
flint	–	1,0	2,1	0,5	1,5	1,3	0,1	1,0	0,2	0,2	0,1	–	0,3	0,4	5,2	0,7
total	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0	100,0

Naqada IA

The distinction made by Kaiser between *Stufe* Ia and Ib cannot be confirmed beyond doubt for the cemeteries for which a map is available.[78] This was also noted by Friedman for cemetery 7000 at Naqa ed-Deir, where tombs predating *Stufe* Ic are present, but could not be distinguished in groups matching Kaiser's *Stufe* Ia and Ib.[79] Only in the eastern part of the Naqada Main Cemetery was it possible to distinguish spatially a number of Naqada IA–B tombs, but a clear distinction between IA and IB could not be made, although this may be due to the incomplete data available. A number of individual tombs from the cemeteries E and U at Abydos, as well as tombs from el-Amrah, can be attributed to Naqada IA because of the presence of simple Black-Topped cups and beakers belonging to Petrie's types B 18 d, B 21 b and B 22 b/d/f. Also frequently occurring in tombs attributed to Naqada IA is White Cross-Lined pottery, the types of which are mainly simple convex round based bowls and plates (C 10 e/l/n), although restricted cups (C 64 b/n) and slender restricted jars (C 76 h) are also represented. Restricted shapes and lip rims are however very exceptional.

Naqada IB

Besides the tombs already mentioned from Naqada Main Cemetery, a small group of Naqada IB tombs occurs south of the centre of cemetery 2600–2700 at Matmar. In the ceramic assemblage, there is a noted increase of Red-Polished pottery. The type variation increases both for the Black-Topped and White Cross-Lined class. Besides the simple Black-Topped cups and beakers with straight wall already mentioned for Naqada IA, types with inflected wall, some of them large in size (B 18 b/c, B 21 c/d2, B 22 j, B 25 b/c, B 26 b), become characteristic. Additional types for the White Cross-Lined are oval plates (C 4 h, C 5 d/m, F 11 a) and exceptionally flat based bowls with concave wall (C 35). The frequency of slender restricted jars increases. The Red-Polished types consist mainly of small bowls and plates (P 1 a, P 11 a, P 17), as well as slender jars (C 75 b, C 76 d, C 76 w), the

[78] Hendrickx (n. 39), 41.
[79] Friedman (n. 66).

shapes of which also occur among the Black-Topped and White Cross-Lined pottery.

Naqada IC

Groups of Naqada IC tombs can be spatially identified at several cemeteries (Matmar, Salmany, Naqada and Armant). Both cups and beakers with straight and flaring walls occur, but the latter group shows increasing variability. Among the tall beakers, the importance of high, slender types increases (B 27 a, B 27 f, B 35 a) and types with explicit concave upper part (B 26 a–c). Hardly ever attested before are restricted regularly curved jars with large aperture (B 55 b, B 57 a/b, B 58 b/c, B 62 b/d, B 77 a), or similar shouldered jars (B 71 b, B 74 a/b, B 79 a). Also new are flat based bottles (B 92 a/b), which also occur among the Red-Polished pottery (P 56 a/b). As before, the majority of the Red-Polished pottery however reflects shapes known for the Black-Topped.

The majority of the White-Cross lined bowls and plates have, by this stage, concave walls and a flat base (C 24, C 26 l, C 27 n, C 30 h) or inflected walls with concave upper part (C 53–54). Although the decoration still primarily consists of geometric motifs (probably imitation of basketry), figurative representations become more frequent. The limited amount of Rough pottery which occurs from now on consists mainly of small bowls and plates. Footed stone vessels, almost exclusively from basalt,[80] and rhomboidal or fishtail flint knives remain exceptional and are of the same types as during Naqada IA-B. There is, on the other hand a marked increase in palettes, mainly rhomboidal in shape.

Naqada II

The definition of the transition between Naqada I and II is most problematic. According to Kaiser's general principles, *Stufe* I should be dominated by Black-Topped pottery, which is indeed a fact, and *Stufe* II

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[80] Cf. L. M. Mallory-Greenough, J. D. Greenough & J. V. Owen, "The Stone Source of Predynastic Basalt Vessels: Mineralogical Evidence for Quarries in Northern Egypt", *JAS* 26 (1999), 1261–1272.

by Rough pottery. This however, is not so for *Stufe* IIa at the Armant cemetery, where Black-Topped pottery remains dominant and even for *Stufe* IIb the prevalence of Rough over Black-Topped pottery remains limited.[81] The differences between *Stufe* IIa and IIb, when the dominant class of pottery changes from Black-Topped to Rough, and especially between *Stufe* IIb and IIc, with the introduction of Wavy Handled pottery and a number of new Decorated types, are much more important than the difference between *Stufe* Ic and IIa. It is to be noted, however, that the Rough pottery does not appear out of the blue at a certain moment in the evolution of the Naqada culture. It is more than obvious from settlement excavations that the Rough pottery makes up the vast majority of pottery since the beginning of the Naqada culture and even already during the Badarian,[82] but the Rough ware finds its way only slowly to the cemeteries.

There are certainly enough reasons to make a distinction between a first and a second period within the development of the Naqada culture, but it seems more logical to draw the line between *Stufe* IIa and IIb or perhaps even between *Stufe* IIb and IIc. However, for the revision of Kaiser's *Stufen* chronology presented here, the division between *Stufe* I and II has been maintained between Naqada IC and IIA, the archaeological characteristics of which are largely identical with Kaiser's *Stufen* Ic and IIa. This is in order not to introduce yet another completely different system which would render the use of older literature difficult.

Naqada IIA

As for the Naqada IC period, spatially distinguished groups of tombs can be identified at the cemeteries of Matmar, Salmany, Naqada and Armant. The expansion into Nubia has continued and A-group cemeteries contemporaneous with Naqada IIA–B can be found south of those already identified for Naqada I. Black-Topped pottery remains dominant but White Cross-Lined ware disappears largely while Rough pottery for the first time makes up a relevant part of the ceramic assemblage. The distinction between Naqada IC and IIA does not only

[81] Hendrickx (n. 39), 39–40.
[82] E.g. Brunton (n. 12); Hendrickx et al. (n. 24).

depend on the representation of the wares. Of great importance is the appearance, during Naqada IIA, of a number of pottery types, especially small bag-shaped Rough types with pointed base (R 65 b/c, R 66 a/p, R 69 c/d), which were not yet present during Naqada IC. With regards to the Black-Topped pottery, the very early cups and beakers with straight wall disappear almost completely. For the remaining Black-Topped types there is little difference from Naqada IC, although the occurrence of modelled rims is new (e.g. B 35 b, B 37 b, B 38 c, B 50) as well as large flat based, regularly curved jars with strongly marked rim (B 53 a/b). Once again, the shapes of the Red-Polished pottery are related to those of the Black-Topped class. Rhomboidal palettes still occur regularly but the number of fish shaped palettes increases.

Naqada IIB

Spatially distinguished groups of tombs can once again be recognised at the cemeteries of Matmar, Salmany, Naqada and Armant, already in use from at least the Naqada IC period. The quantitative importance of Black-Topped pottery starts to diminish, although it is still the best represented class. Beakers now occur only with inflected walls and mainly exclusively with slender shapes (groups B 25, B 27, B 35) and often with modelled rim. The majority of the Black-Topped types consists of regularly curved jars, a limited number of which has pointed bases (groups B 41, B 44) but the majority is flat based (groups B 56–58, B 62–68). The diversity of Red-Polished types increases and is not as closely linked to the Black-Topped types as was previously the case.

The presence of Rough pottery has more than doubled. This is reflected in a more important diversity of cups and bowls (R 1–36), the previously occurring small bag shaped jars (R 62–69) with pointed base and also large storage jars (R 80–86) which will become very characteristic for the Naqada IIC–IID2 period. White Cross-Lined pottery has disappeared completely and is replaced (?) by a limited number of Decorated types, the decoration of which is limited to spirals, undulating lines and "scales". That the limited number of Late types is indeed made from marl clay cannot be confirmed beyond doubt given the confusion within this class of pottery, where no clear distinction has been made between Nile silt and marl clay pottery.

There are some indications for regional diversity during Naqada IIB. Friedman observed a strong presence of Black-Topped ware for *Stufe* IIb at Naqa ed-Deir,[83] and a similar phenomenon was also noted by Kaiser for el-Mahasna.[84] For Naqada, Payne noted differences with *Stufe* IIb as described by Kaiser.[85] All of this seems to indicate that the transition between Naqada IIA/B and Naqada IIC did not happen in the same manner and/or at the same moment for the whole of UE.

Naqada IIC

Cemeteries and settlements of this period are to be found over a larger area than those of the previous period. Besides at the cemeteries already mentioned for the previous periods, Naqada IIC was also spatially identified at Badari, Hammamiya, Naqa ed-Deir and the Hierakonpolis Fort Cemetery. Furthermore, Naqada IIC occurs at cemeteries in the neighbourhood of the Fayum (Gerza,[86] Haraga,[87] and Abusir el-Meleq),[88] and in the eastern Nile delta the important cemetery at Minshat Abu Omar may have started towards the end of Naqada IIC but probably rather during Naqada IID.[89] In Nubia, A-group cemeteries with strong Egyptian influences can be found.

With the Naqada IIC period, major changes occur in the pottery assemblage. The importance of the Black-Topped class drops dramatically and at the same time there is a marked increase of Rough pottery. The appearance of Wavy-Handled pottery is also very important. Although a limited number of the already known types still occurs, Black-Topped pottery is now dominated by shouldered jars with a small base and modelled rim (B 38 a/c, B 53 a–c) and similar shapes with pointed base (B 39 a–b). The Red-Polished pottery already in use during the previous period continues to be used. The most important difference is a strong increase of regularly curved jars with a small base (P 40 group). The diversity within the Rough class increases, mainly

[83] Friedman (n. 66), 74–5.
[84] Kaiser (n. 53), 74.
[85] Payne (n. 39), 81.
[86] W. M. F. Petrie, *The Labyrinth, Gerzeh and Mazguneh* (London, 1912).
[87] R. Engelbach & B. Gunn, *Harageh* (London, 1923).
[88] Scharff (n. 48).
[89] W. Kaiser, "Zum Friedhof der Naqada-Kultur von Minshat Abu Omar", *ASAE* 71 (1987), 119–126.

because of the differentiation within previously occurring groups. The large jars (R 81–86), which are a very important part of the Rough class, are totally dominated by the type R 81.

The new Wavy-Handled class is dominated by W 19, but the earliest examples of this class (W 1–3) also belong to this period although their provenance and position is sometimes unclear.[90] The Decorated pottery is dominated by relatively small flat based regularly curved jars (e.g. D 43) and broad round based vessels (e.g. D 61), both with lug handles. Besides the decorative patterns already present, there a now very characteristic figurative representations (D 40–48). Marl clay pottery is certainly represented from Naqada IIC onwards. Both the Wavy-Handled and the Decorated class are made from this fabric, as is the large majority of the Late pottery. The latter is primarily used for cups and bowls, as well as a number of medium sized shouldered jars (L 53 a–b). The types of stone vessels that had occurred up until now have disappeared and are replaced by shapes inspired by the Decorated pottery. Rhomboidal palettes become rare, and in their place we find fish shapes and palettes with antithetic bird's head.

Naqada IID1

Cemeteries and settlements are now probably also found in the delta (Minshat Abu Omar, Kafr Hassan Daoud) and the gradual replacement of the Maadi-Buto culture can be observed at Buto (cf. below). Black-Topped pottery becomes rare and only a number of regularly curved and shouldered jars occur (B 38 c, B 39 a–b, B 53 a–b), all of them with modelled rim. For the Red-Polished pottery there is hardly any difference from Naqada IIC, both in frequency and typology. A similar observation can be made for the Late class, despite its slowly increasing importance. Rough pottery continues to represent over half of the assemblage. The most important changes are to be found in the group of large storage jars where type R 81 is gradually replaced by the types R 84 and especially R 85 h and R 86 d, meaning that vessels with a small or pointed base are preferred to round based examples. The Wavy-Handled types become smaller and more slender (W 25, W 44) compared to the types characteristic for Naqada IIC. The two

[90] Kaiser (n. 48), 87–109.

Decorated types characteristic for Naqada IIC (D 43, D 61) continue to be used but figurative representations occur less frequently. The stone vessel types remain identical to those of Naqada IIC, while rhombic palettes have almost completely disappeared.

Naqada IID2

The definition of Kaiser's *Stufen* IId2 and IIIa1 causes a problem because they share the same Wavy-Handled types and differ mainly through the presence or absence of Black-Topped types, the number of which is at any rate minimal, and through their Decorated types, which also only account for a very small part of the assemblage. Another characteristic should be the transition from R 84–86 to L 30 b,c but the latter types are in reality very similar to R 84 and R 84 c and the difference consists mainly of a less well cared for product. It is therefore to be feared that the attribution of a vessel to one of these types by excavators other than Petrie may have been rather arbitrary. Also the spatial distribution at Armant Cemetery 1400–1500 easily allows for a different clustering of graves, by which the group defined by Kaiser as *Stufe* IId2, no longer exists.[91] Furthermore, the Wavy Handled types always seem to display the fastest evolution of shape, and it would be very strange if this would not have been so during *Stufe* IId2–IIIa1. For all these reasons the archaeological description of the *Stufen* IId2 and IIIa1 cannot be maintained in the way in which it was defined by Kaiser and the description given here for Naqada IID2 therefore differs to some extent from Kaiser's *Stufe* IId2. The distribution of cemeteries and settlements remains the same as for Naqada IID1.

Wavy-Handled and Late pottery increases in importance while all other classes decrease (lightly). The types represented for Black-Topped and Red-Polished pottery nevertheless remain almost identical. This is not the case for Late pottery, where not only the previously known cups, bowls and jars (L 53 group) show a greater diversity but furthermore a new type of large, round based shouldered jars (especially L 36 n) occurs. The latter will become increasingly popular from Naqada IIIA1 onwards. The large majority of the Rough types present during Naqada IID1 remains so, but with less diversity. A few new types occur,

[91] Hendrickx (n. 69), 274–276, pl. 87–89.

which are mainly imitations of Late types (e.g. R 57 b-c). Among the large storage jars, the decline of type R 81 already noted for Naqada IID1 continues, for the benefit of R 84 (= L 30 b) and R 86 p (= L 30 –). There is a marked change for the Decorated ware. Of the two shapes typical from Naqada IIC onwards, the small flat based regularly curved jars (e.g. D 43) hardly ever occur any more, while the broad round based vessels (e.g. D 61) still do. Figurative representations are almost completely missing. For the Wavy-Handle class, the tendency towards smaller vessels and narrow shapes continues (groups W 43 and W 47), while the handles loose their functionality.

Naqada III

The transition from Kaiser's *Stufe* II to *Stufe* III is not without problems. The difference between them is made up by the Late class, which takes over from the Rough class as numerically the most important group. However, Kaiser's view of the spatial distribution of the Rough and Late pottery at Armant[92] does not take into account the fact that an important number of the Late types are in reality made in the Rough fabric (especially the types belonging to the L 30 series), although he is well aware of the problem.[93] Counting these with the Rough class, shows that at Armant no part of the cemetery is dominated by marl clay pottery. However, this does not mean that groups of graves dominated by marl clay pottery do not occur during the Naqada culture. On the contrary, large groups of graves at Elkab and Hierakonpolis for instance, and even entire cemeteries such as those of Tarkhan, Tura and Abu Roash are completely dominated by marl clay pottery. Only the transition in dominance from Rough to Late pottery should be placed more recently than suggested by Kaiser. This raises the question of whether a transition from Naqada II to III should be situated at this moment. As we are dealing with a gradual evolution and not with sudden changes, this question is only of limited importance. A change of main period is not supported by the characteristics of the funerary equipment of the tombs. However, as it is certain that at least from the beginning of the Naqada III period that the Naqada culture

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[92] Kaiser (n. 53), Pl. 15 B–C.
[93] Kaiser (n. 53), 76, note 9.

has spread over the whole of Egypt and as the earliest writing and historical documents occur during the Naqada IIIA1 period (cf. below), it seems possible nevertheless to maintain the division between Naqada II and III, albeit not for the original reasons. Naqada III sites occur throughout Egypt and Nubia and their distribution can no longer be used as a possible element for chronological information.

Naqada IIIA1

The definition of Kaiser's *Stufen* IIIa1 causes a particular problem. The number of tombs at Armant for *Stufe* IIIa1 is very limited,[94] and the Wavy-Handled types found in them are very similar to those of *Stufe* IId2. As mentioned already there is no domination by marl fabric pottery that would make a difference from *Stufe* IId2. It therefore seems impossible to retain *Stufe* IIIa1 in the way defined by Kaiser and the description given here for Naqada IIIA1 will differ strongly. The majority of *Stufe* IIIa1 tombs is included in Naqada IID2, while part of *Stufe* IIIa2 is considered a separate entity and redefined as Naqada IIIA1 (cf. below).

Black-Topped pottery no longer occurs and the importance of Red-Polished pottery has strongly diminished. For most types of the latter class, parallels can be found among the Late pottery and it is very possible that confusion has occurred. Unfortunately it has not yet been possible to check whether the vessels identified as Red-Polished are indeed made from Nile silt and not from the marl fabric characteristic of the Late class. The large Rough storage jars are now dominated by slender types (L 30 g/k, L 31 a) which are, however, taller than the Naqada IID types. Among the round based shouldered marl clay storage jars the types L 36 n/s are particularly well represented. There are no important changes in the remaining part of the Late pottery, although the diversity and quantity increases. The Decorated pottery characteristic of Naqada IIC–IID2 no longer occurs. The types of vessels, which are now decorated also, occur without decoration among the Late class. The decoration is largely reduced to series of undulating lines (groups D 20–21, D 24–25). The Wavy-Handled types again become more slender (W 49–50) and the handles that had already lost

[94] Only 4 tombs. It is to be noted that on the distribution plan (Kaiser (n. 53), Pl. 20 C), the symbols for *Stufe* IIIa1 and IIIa2 have been confused.

their functionality are, in a number of cases, changed into a continuous ornamental band (W 51 a, W 56 a, W 56 g). Finally it is to be noted that palettes show less diversity in shape and are dominated by simple rectangular types.

Naqada IIIA2

Kaiser's definition of *Stufe* IIIa2 at Armant is based on a very limited number of graves and the majority of the types of objects presented as characteristic for *Stufe* IIIa2,[95] are not represented at the Armant cemetery. The description of *Stufe* IIIa2 is therefore largely theoretical. When studying the spatial distribution of the Naqada III cemetery of Elkab two groups could be distinguished within material characteristic for Kaiser's *Stufe* IIIa2.[96] A similar observation could be made for the Hierakonpolis Fort Cemetery,[97] which was also not yet published at the time when Kaiser made his study of the relative chronology. Because of this and the above mentioned problems with the *Stufen* IId2–IIIa1, the earliest group distinguished within Kaiser's *Stufe* IIIa2 was readjusted to Naqada IIIA1. The validity of this was later confirmed by the horizontal development of the elite tombs at cemetery U at Abydos and especially the position of tomb U-j and the types of objects found in it (cf. below).

The Naqada IIIA2 period is characterised by a spectacular decrease of the Rough class in favour of Wavy-Handled pottery. It is to be noted however, that this picture is strongly influenced by the Tarkhan Valley cemetery from which the majority of the Naqada IIIA2 tombs known comes. The possibility for regional variation, especially between UE and LE, can therefore not be excluded. The Nile silt Red-Polished pottery has now been completely replaced by marl clay Late ware, the variety and quantity of which once again increases. The large round based shouldered storage jars are now dominated by somewhat broader types (L 36 a/g2/k).[98] The large Rough jars consist mainly of very slender pointed jars (L 31 a), while the series R 84–86 no longer occurs.

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[95] Kaiser (n. 53), Pl. 24 B.

[96] Hendrickx (n. 70, Elkab V), 205–16.

[97] See the review by S. Hendrickx, *BiOr* 47 (1990), col. 643–646.

[98] Naqada IIIA2 tombs have been published both according to Petrie's predynastic and protodynastic typology (Petrie (n. 42), 1921, (n. 45), 1953). The most important

Decorated pottery diminishes in quantity, but for the remaining examples both the vessel types and the decoration are identical to Naqada IIIA1. It is however to be noted that the amount of Decorated vessels would be much higher if the Wavy-Handled jars of type W 62 with net pattern decoration would be included. These are most characteristic for Naqada IIIA2 and are part of the Wavy-Handled jars with their maximum diameter located at the rim, relatively broad base and continuous decorative band (W 55, W 58, W 61, W 62).[99] The stone vessels consist mainly of calcite bowls and plates. Animal shaped palettes have almost completely disappeared. The vast majority are rectangular with incised lines around the edges.

Naqada IIIB

Kaiser's *Stufe* IIIb does not occur at the Armant cemetery, on which his chronological framework is based, and is therefore mainly an interpretation of the theoretical evolution of the Wavy-Handled types. More recently, Kaiser divided *Stufe* IIIb in two subdivisions, IIIb1 and IIIb2 and added three *Stufen*, IIIc1, IIIc2 and IIIc3.[100] With the late types of the Wavy Handled class as main characteristics, the chronological stages distinguished by Kaiser are summarised in Table II. 1.5.[101] The distinction made between *Stufe* IIIb1 and IIIb2 does not seem justified, since at Tarkhan, for instance, pottery types characteristic of the *Stufen*

concordances for the marl fabric storage jars are: 60 g = L 36 n, 60 j = L 36 k, L 60 m = L 36 a.

[99] For the Naqada IIIA2 Wavy-Handled jars, the most important concordances between Petrie's predynastic and protodynastic typologies are: 46 b = W 62 –, 46 d = W 58, 46 f = W 58 –.

[100] Kaiser (n. 58). In an earlier stage of research, Kaiser distinguished three periods, called *Horizonte* [W. Kaiser, "Einige Bemerkungen zur ägyptischen Frühzeit. III. Die Reichseinigung", *ZÄS* 91 (1964), 92–96; W. Kaiser & G. Dreyer, "Umm el-Qaab. Nachuntersuchungen im frühzeitlichen Königsfriedhof. 2. Vorbericht", *MDAIK* 38 (1982), 260–269]. For discussion of a number of problems related to the *Horizonte*, see E. C. M. van den Brink, "The Incised Serekh-signs of Dynasties 0–1, Part I: Complete Vessels", in: Spencer (n. 39), 148–150.

[101] Kaiser (n. 58) gives no archaeological description for these new *Stufen*, neither does he discuss the way in which they have been distinguished. Therefore, Table II. 1.5 is based on personal information kindly supplied by W. Kaiser (Poznan symposium 1992, letter 30 Oct. 1993). The following correlation with the early kings of Egypt can be made: *Stufe* IIIb2 = Iry-Hor and earlier; *Stufe* IIIc1 = Ka—Narmer; *Stufe* IIIc2 = Hor Aha—Djer; *Stufe* IIIc3 = Djet/Den until the end of Dyn. 1.

Table II. 1.5. Relative chronological periods as distinguished by Kaiser (n. 53); idem (n. 58), Abb. 1 and Hendrickx (n. 69), idem (n. 39), 36–43, illustrated by the types of Wavy Handled/Cylindrical jars

Kaiser 1957, 1990	Stufe	Hendrickx 1989, 1996	Naqada
–	–	no cylindrical jars	IIID
50 t	IIIc3	50 b-c / h-t	IIIC2
50 d	IIIc2	50 d-g	IIIC1
48 s-t, 49 d, 50 d	IIIc1	–	–
48 s-t, 49 d/l	IIIb2	–	–
47	IIIb1	47 r-t, 48 s, 49 d/g	IIIB
W 50–51 a, 55, 56 g, 61–62	IIIa2	W 55, 58, 60–62	IIIA2
–	–	W 49–51, 56 a/g	IIIA1
W 41, 43 b, 47 g	IIIa1	–	–
W 41, 43 b, 47 g	IId2	W 41–42, 43 b, 47 a/g/m	IID2
W 24, 25	IId1	W 24–25, 27	IID1
W 3, 19	IIc	W 3, 19	IIC

IIIb1 and IIIb2 are very often present together in the same tomb.[102] Furthermore, the spatial distribution of the two groups of types shows no obvious patterning at Tarkhan. Also, the very obvious spatial distribution of the Turah cemetery does not support the idea of a chronological difference between the above mentioned types.[103] Therefore, the description of Naqada IIIB as presented here is more or less equivalent to both *Stufe* IIIb1 and IIIb2.

In terms of percentages, the distribution of the pottery classes remains almost identical to Naqada IIIA2. There are however a number of important changes in the types of vessels. The slender Rough jars with pointed base have almost completely disappeared. The other Rough types hardly change. For the marl clay storage jars, two size classes can be distinguished. The smaller types (L 36 b, L 38 a) occur more frequently than the large ones (L 36 a, L 36 k). A rare but notable new type is large jars with applied rope decoration, generally considered to be wine jars (protodynastic 76).[104] On the one hand, the few Decorated vessels remaining are identical to those of the Naqada IIIA1

[102] Hendrickx (n. 39), 58–59.

[103] Hendrickx (n. 39), 59.

[104] For this type of jars, see van den Brink "The Incised Serekh-signs of Dynasties 0–1, Part I: Complete Vessels"; idem, "The Pottery-Incised Serekh-Signs of Dynasties 0–1. Part II: Fragments and Additional Complete Vessels", *Archéo-Nil* 11 (2001), 23–100. His group I–II occurs mainly during Naqada IIIB, group III–IV during Naqada IIIC1.

period. Net paintings on Wavy Handled jars, on the other, have almost completely disappeared. The Wavy Handled class is now represented by cylindrical jars with a small band of incisions instead of an applied decorative band (W 71 a, W 80 = 47 r-t, 48 s, 49 d/g). A remarkable change is the strong increase in stone vessels. Among them are imitations of the cylindrical jars and a large amount of bowls and plates.

Naqada IIIC1

Kaiser's *Stufe* IIIc1 consists of types which are partially characteristic for *Stufe* IIIb2 and partially for *Stufe* IIIc2. The existence of this kind of "transitional period" can of course not be denied, but it is not appropriate to distinguish a period, which has no types of objects characteristic for that period only. This is especially so since the archaeological description of the *Stufen* is often used for dating individual graves or even objects. It therefore seems better to distinguish less periods, and admittedly have eventually a slightly less detailed idea of the chronological evolution of a cemetery. A limited amount of the types mentioned for *Stufe* IIIc1 is therefore in the present description integrated in Naqada IIIB, but the large amount is joined with Kaiser's *Stufe* IIIc2 types into Naqada IIIC1.

The Late class now becomes more important than the Wavy-Handled. The marl fabric storage jars still consist of large (protodynastic 60 b/d) and smaller types (59 group), but there is also a new group of still smaller jars (65 group).[105] Very large jars with decorative band (76 group) already occurred occasionally during Naqada IIIB, but now become more frequent. Large Rough jars with pointed base on the other hand no longer occur and the same applies to Decorated vessels. The Wavy-Handled jars have now evolved into cylindrical jars with slightly curved wall and without decorative band (W 90 = 50 d–g). The previously occurring stone vessel types continue to be used but an increase in squat jars and restricted cups can be observed.

[105] See S. Hendrickx et al., "Milk, Beer and Bread Technology during the Early Dynastic Period", *MDAIK* 58 (2002), 284–286.

Naqada IIIC2

Naqada IIIC2 largely coincides with Kaiser's *Stufe* IIIc3. The amount of Wavy-Handled cylindrical jars diminishes drastically, but the amount of stone vessels shows an almost identical increase. As the latter group consists for a considerable part of cylindrical jars, it is obvious that this is merely a change of material and not of vessel type. The pottery cylindrical jars without decorative band have straight walls and are narrow (protodynastic 50 b–c/h–t) compared to those of Naqada IIIC1. The large marl fabric storage jars become far less frequent than previously, but the occurrence of the small (protodynastic group 59) and even smaller types (group 65) strongly increases. The large wine jars with applied band decoration continue to be present. Palettes have almost completely disappeared from the tomb equipment.

Naqada IIID

Naqada IIID is less well defined than the other phases of the Naqada culture which have been described. This is due to the limited number of tombs identified as Naqada IIID, the majority of which come from Qaw and Abu Roash.[106] This could however be improved as the recent excavations at Adaïma and Helwan have yielded tombs apparently dating to Naqada IIID. In future, it should be possible to distinguish subdivisions within Naqada IIID and probably also regional differences. The link with the early Dyn. 3 pottery is probably closer than has been suspected before, but this also needs further investigation. It is also problematic that an important characteristic of Naqada IIID is defined in a negative manner, that is to say the absence of cylindrical jars. Both of the smaller types of marl fabric storage jars continue to be important. The large wine jars with applied band decoration have developed into "torpedo" shapes with almost vertical walls and high rims (protodynastic 76 s/u/y). In addition, the vessels are made with less care. This tendency apparently becomes more explicit as Naqada IIID advances. Most important is the appearance of new types of vessels, which will develop further during the OK. Among them bowls with

[106] The Abu Roash tombs are not integrated in Table II. 1.4a–b because they are not published according to Petrie's typologies.

internal rim,[107] early Maidum bowls and beer jars.[108] Among the stone cylindrical jars, nearly all of them in calcite, types without decorative band are now more frequent than those with. New is the frequent occurrence of dummy calcite cylindrical jars.

Correlation between Naqada III and Dyns. 0–2

Before discussing the actual correlation between Naqada III and Dyns. 0–2, the use of the concepts "Dyn. 0" and "Dyn. 00" should be discussed. The first notion was already used on occasion by Petrie and Quibell but has only far more recently gained wide acceptance after its reintroduction by Kaiser.[109] Dyn. 0 has however been used with different meanings and the only consistency is the inclusion of Iry-Hor and Ka. Perhaps its use can be defended for referring to the line of kings from Abydos identified through inscriptions and tombs at the cemeteries U and B. Dyn. 00 on the other hand has only occasionally been used, partially overlapping the meaning of Dyn. 0. Unless it's significance would be clearly defined and generally accepted, it seems better to avoid the use of Dyn. 00. A number of elite tombs can be connected by inscriptions or seal impressions with the Late Predynastic—Early Dynastic kings.[110] The relative chronological position of these tombs was in some cases defined when studying the spatial distribution within the Naqada III cemeteries of LE (Tarkhan, Turah). However, the royal tombs from Abydos and the elite mastabas from Saqqara are mainly attributed to a particular Naqada period by the characteristic objects they contained (Table II. 1.6). It is furthermore possible to integrate the spatial distribution of the elite tombs from cemetery U at Abydos, which can be linked to the local late predynastic kings.[111]

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[107] D. Raue, "Ägyptische und nubische Keramik der 1.–4. Dynastie", in: W. Kaiser et al., "Stadt und Tempel von Elephantine 25./26./27. Grabungsbericht", *MDAIK* 55 (1999), 173–189.

[108] Hendrickx et al. (n. 105).

[109] Kaiser (n. 14), 71.

[110] Hendrickx (n. 39), 59–61.

[111] G. Dreyer, Umm el-Qaab: Nachuntersuchungen im frühzeitlichen Königsfriedhof. 3./4. Vorbericht. *MDAIK* 46 (1990), 61–62; idem, Umm el-Qaab. Nachuntersuchungen im frühzeitlichen Königsfriedhof. 5./6. Vorbericht. *MDAIK* 49 (1993), 36–37; idem, *Umm el-Qaab I. Das prädynastische Königsgrab U-j und seine frühen Schriftzeugnisse* (Mainz, 1998), 18–19; G. Dreyer et al., Umm el-Qaab. Nachuntersuchungen im frühzeitlichen Königsfriedhof 7./8. Vorbericht. *MDAIK* 52 (1996), 29–30; R. Gundlach, *Der Pharao*

Table II. 1.6. Correlation between Naqada IIIA1–IIID and Dyns. 0–1

King	Naqada	Abydos	Saqqara	Tarkhan	Turah
Qa-a	IIID	Q	S 3120, S 3121, S 3500, S 3505	–	–
Semerkhet	IIIC2/D	U	–	–	–
Adjib	IIIC2	X	S 3038, S 3111, S 3338	–	–
Den	IIIC2	T	S 3035, S 3506, S 3507, S X	–	–
	IIIC1/2	–	S 3036	–	–
Djet	IIIC2	Z	S 3504	1060	–
Djer	IIIC1	O	S 3471, S 3503	–	235
Hor-Aha / Djer	IIIC1/2	–	–	300	–
Hor-Aha	IIIC1	B 10/15/19	S 3357	–	–
Narmer	IIIC2	–	–	1982	–
	IIIC1	B 17/18 (?)	–	414, 415, 1100	–
Ka	IIIC1	–	–	261	–
	IIIB/C1	–	–		1627, 1651
	IIIB	B 7/9	–	–	–
Iry-Hor	IIIB	B 1/2	–	–	–
–	IIIB	U-t, U-x, U-y, U-z	–	1702	54, 64, 89
–	IIIA2	U-g, U-h, U-s, U-u, U-v	–	–	–
Scorpion I	IIIA1	U-j	–	–	–
–	IIIA1	U-a, U-k, U-o, U-r, U-qq	–	–	–

In the southern part of cemetery U at Abydos, a group of mud brick lined tombs clearly dates to Naqada IIIA1. It is even possible within this group to recognise a west-east evolution from older tombs (U-a, U-o, U-qq) to more recent tombs (U-r, U-k, U-j, U-i).[112] The latter are continued further to the east by Naqada IIIA2 tombs (U-f (?), U-g, U-h). Starting from tomb U-s, which still dates to Naqada IIIA2, a series of tombs sets of, linking cemetery U to cemetery B, where the tombs of Iry-Hor up to Hor-ʿAha are located. Unfortunately the evidence published for these tombs in the preliminary reports is limited. Eventually tombs U-u and U-v still date to Naqada IIIA2. U-t probably dates to Naqada IIIB, and because of their position in the cemetery, this would also have been the case for U-y, U-z and U-x. The earliest tombs of cemetery B, those of Irj-Hor (B1–2) and Ka (B7/9) can be dated to Naqada IIIB on more reliable basis.

und sein Staat. Die Grundlegung der ägyptischen Königsideologie im 4. und 3. Jahrtausend (Darmstadt, 1998), 54, Abb. 54.

[112] Dreyer et al. (n. 111, 1996), 29–30.

The pottery found in the tombs of Narmer (B 17–18), Hor-ʿAha and Djer is characteristic for Naqada IIIC1, making this apparently a relatively short period. This seems to be confirmed by the limited number of Naqada IIIC1 tombs at Tarkhan compared to those of Naqada IIIB and also IIIC2.[113] The tombs dating to the reigns of "Serpent", Den and ʿAdj-ib can be attributed to Naqada IIIC2. The position of the tomb of Semer-khet, who apparently only reigned for a short period, remains uncertain because hardly any objects from his tomb are known,[114] and no mastabas dating to his reign have been identified at Saqqara. The tombs dating to the time of Qa-ʿa fit well within Naqada IIID as described above, but although there are certainly similarities with the tombs of late Dyn. 2, there are also differences with the limited amount of pottery known for the tombs of Per-ibsen[115] and Kha-sekhemwy[116] at Abydos. As mentioned before, it is at present impossible to make well defined subdivisions within Naqada IIID but this will certainly be possible in the future.

Radiocarbon Chronology

Radiocarbon dates for Naqada cemeteries are limited in number, and the majority of them have been made a long time ago, resulting in questionable dates and important deviations. Furthermore, the calibration curves for the (second half of the) 4th millennium BC show important fluctuations with long possible data ranges as a consequence. It is generally considered a "bad period" for radiocarbon dating.[117] It is therefore impossible to link the phases of the Naqada culture distinguished to an absolute chronology. The limited number of dates available, at any rate, does not allow for the distinguishing of chronological

[113] Naqada IIIA2: 488 tombs; IIIB: 306 tombs; IIIC1: 73 tombs; IIIC2: 206 tombs.

[114] G. Dreyer et al., "Umm el-Qaab. Nachuntersuchungen im frühzeitlichen Königsfriedhof 11./12. Vorbericht", *MDAIK* 56 (2000), 120–122.

[115] Petrie, *Abydos I*, pl. VII.

[116] Petrie, *Abydos I*, pl. VII; E.-M. Engel, "Abydos. Umm el-qa'ab, Grab des Chasechemui. Deutsches Archäologisches Institut Kairo", *BCE* 20 (1997), 25–28; idem, Abydos, Umm el-Qa'ab, Grab des Chasechemui", *BCE* 21 (2000), 50–58.

[117] Cf. B. Midant-Reynes & P. Sabatier, "Préhistoire égyptienne et radiocarbone", *Archéo-Nil* 9 (1999), 83–107.

phases.[118] By also integrating the dates from settlement sites it is nevertheless possible to confirm the outline defined by Fekri Hassan.[119]

Radiocarbon dates from historically dated royal and elite tombs at Abydos and Saqqara have been used in an attempt to date the reigns of individual kings accurately.[120] This however is not without problems as is shown by the more recently published dates from Abydos,[121] indicating that Scorpion I (tomb U-j) and Hor-ʿAha would be more or less contemporaneous. Because of the characteristics of the funerary equipment and the location within the cemetery, this is however to be excluded. Eventually the use of old wood could account for this type of aberration, something, which might quite easily have occurred in the well-organised elite cemeteries. The correlation presented here (Table II. 1.7) between the Naqada periods, the Dyns. 0–2 kings and the available radiocarbon dates is therefore to be considered preliminary and approximate only. A major problem concerning the interpretation of radiocarbon dates is the discrepancy between the historical chronology and the radiocarbon chronology. The radiocarbon dates are consistently older with by least 100 years,[122] resulting in a very long time span for Dyn. 2. As this dynasty is unfortunately poorly known, this question has to remain open for the time being. Also, the correlation

[118] Contra S. H. Savage, "AMS Radiocarbon Dates from the Predynastic Egyptian Cemetery, N.7000, at Naga-ed-Dêr", *JAS* 25 (1998), 235–249, cf. A. R. Miljard & T. A. H. Wilkinson, "Comment on 'AMS Radiocarbon Dates from the Predynastic Egyptian Cemetery, N7000, at Naga-ed-Dêr by S. H. Savage'", *JAS* 26 (1999), 339–341.

[119] F. A. Hassan, "Radiocarbon Chronology of Archaic Egypt", *JNES* 39 (1980), 203–207; idem, "Radiocarbon Chronology of Predynastic Naqada Settlements, Upper Egypt", *Current Anthropology* 25 (1984), 681–683; idem, "Radiocarbon Chronology of Neolithic and Predynastic sites in Upper Egypt en the Delta", *AAR* 3 (1985), 95–116; F. A. Hassan & S. W. Robinson, "High-precision Radiocarbon Chronometry of Ancient Egypt, and Comparisons with Nubia, Palestine and Mesopotamia", *Antiquity* 61 (1987), 119–135. See also Hendrickx (n. 7), 13–81; Midant-Reynes & Sabatier, *Archéo-Nil* 9 (1999), 83–107.

[120] Hassan, *JNES* 39 (1980), 203–207.

[121] R. M. Boehmer, G. Dreyer & B. Kromer, "Einige Frühzeitliche 14C-Datierungen aus Abydos und Uruk", *MDAIK* 49 (1993), 63–68; J. Görsdorf, G. Dreyer & U. Hartung, "14C Dating Results of the Archaic Royal Necropolis Umm el-Qaab at Abydos", *MDAIK* 54 (1998), 169–175; idem, "New 14C Dating of the Archaic Royal Necropolis Umm el-Qaab at Abydos (Egypt)", *Radiocarbon* 40 (1998), 641–647; Dreyer (n. 111, *Umm el-Qaab I*), 17–19.

[122] Görsdorf, Dreyer & Hartung, *MDAIK* 54 (1998), 175. See also H. Haas et al., "Radiocarbon Chronology and the Historical Calendar in Egypt", in: O. Aurenche, J. Evin & F. Hours, eds., *Chronologies in the Near East. Relative Chronologies and Absolute Chronologie 16,000–4,000 B.P.* (Oxford, 1987), 585–606.

Table II. 1.7. Absolute chronology

	cal. BC	
Naqada IIID	from ca. 2920 onwards	[Semerkhet]/Qa-a – Dyn. 2
Naqada IIIC2	ca. 3000–2920	Djet – Adjib
Naqada IIIC1	ca. 3150–3100	Narmer – Djer
Naqada IIIB		U-t, Iry-Hor – Ka
Naqada IIIA2	ca. 3350–3150	U-g,h,s,u,v
Naqada IIIA1		U-a,k,o,r,qq – Scorpion I
Naqada IIC–IID2	ca. 3600–3350	
Naqada IA–IIB	ca. 4000/3900–3600	

Table II. 1.8. Concordance between the Buto stratigraphy and the relative chronologies of the Naqada culture and the Southern Levant (after E. C. Köhler, *Tell el-Fara'in—Buto III. Die Keramik von der späten Naqada-Kultur bis zum frühen Alten Reich (Schichten III bis VI)* (Mainz, 1998); Faltings, in: *Interrelations*, 165–170; Levy & van den Brink, in: *Interrelations*, 3–38)

Buto	Maadi	Naqada period	Southern Levant
Buto V		Naqada IIIC2–IIID	EB II
Buto IIIf–IV		Naqada IIIB–IIIC1	EB IB (late)
Buto IIId–e		Naqada IIIA2	EB IB (middle)
Buto IIIb–c		Naqada IIIA1	
Buto IIIa		Naqada (IID1)–IID2	EB IB (early)
Buto IIb		Naqada IIC–IID1	
Buto IIa	Wadi Digla II	Naqada IIA–B	EB IA
Buto Ib	Wadi Digla I	Naqada IC	
Buto Ia		(Badari) – Naqada IA–B	Late Chalcolithic

between radiocarbon dates from the southern Levant and Egypt is equally problematic.[123]

Maadi-Buto Culture[124]

The importance of this culture has only been realised during the last decade. The Maadi-Buto culture, dating mainly to the 4th millennium BC, is no longer regarded as a regional culture in the neighbourhood

[123] E. Braun, "Proto, Early Dynastic Egypt and Early Bronze I–II of the Southern Levant: Uneasy 14C Correlations", *Radiocarbon* 43 (2001), 1279–1295.

[124] Only a short overview is presented here. More detailed archaeological descriptions can be found in the literature mentioned.

of Maadi, today a modern suburb of Cairo, because it was apparently present over a large part or perhaps even the whole of LE, especially during Naqada IIC/D.[125] This, however, does not necessarily implicate a political unity of LE.[126] The connection between the different chronological phases, early, middle and late Maadi-Buto, recognised at Maadi and Buto between themselves and in relation with the relative chronology of the Naqada culture,[127] poses considerable problems and the earlier phases in particular have been revised several times over recent years. At present they can nevertheless be summarised with some precision.[128]

Of great importance is the presence in the lowest layer of occupation at Buto, Stratum Ia/b, of a large quantity of locally made south Levantine Chalcolithic-style pottery, known from the Beersheba culture in the southern Levant.[129] Stratum Ia, containing about one-third of locally made Chalcolithic pottery, is to be dated before 3700 cal BC,[130] contemporaneous with Naqada IA/B. The remaining part consists of LE Neolithic pottery. The amount of south Levantine Chalcolithic-style pottery diminishes in Stratum Ib, which could be contemporaneous with Naqada IC, although this is mainly based on the intermediate position of this stratum between Buto Ia and IIa for which more reliable links with the Naqada culture are available. Buto II represents the "classical" stage of the Maadi-Buto culture and the two layers distinguished, Buto IIa and b, can be dated to respectively Naqada IIA–B and Naqada IIC–IID1. Buto Stratum IIIa, corresponding mainly to Naqada IID2, represents a transitional phase between the LE Maadi-Buto culture and the Naqada culture which by that time has started spreading northward. The influence of the Naqada culture in the Delta becomes far more important during Buto Stratum IIIb–c, corresponding roughly to Naqada IIIA1. During Buto Stratum IIId–f hardly any elements of the Maadi-Buto culture remain. (See also page 487, first footnote).

[125] Levy & van den Brink, in: *Interrelations*, 11–13.
[126] See however Levy & van den Brink, in: *Interrelations*, 8.
[127] Levy & van den Brink, in: *Interrelations*, 13, Table I.4.
[128] Faltings, in: *Interrelations*, 165–170; Levy & van den Brink, in: *Interrelations*, 19, Table I.8.
[129] Faltings, in: Stationen, 35–45; idem (n. 6, *Proceedings*); idem, in: Interrelations 165–170. See also C. Commenge & D. Alon, "Competitive Involution and Expanded Horizons: Exploring the Nature of Interaction between Northern Negev and Lower Egypt (c. 4500–3600 BCE)", in: *Interrelations*, 139–153.
[130] Faltings, in: *Interrelations*, 168.

II. 2 INSCRIPTIONAL EVIDENCE FOR THE RELATIVE CHRONOLOGY OF DYNS. 0–2[1]

Jochem Kahl

Sources

Contemporaneous king-lists intended as historical records are not at our disposal for reconstructing the chronology of the earliest dynasties nor for establishing the order of the kings. That such lists existed is shown by the Royal Annals.[2] The only contemporaneous sources are of a different nature, viz. a) kings' names inscribed on ritual or festival vessels or on administrative seals (and in one case, on a non-royal statue), useful in reconstructing the succession of kings; b) administrative labels citing eponymous events of specific years and stone vessels inscribed with festival notes which aid in determining the length of reigns. Later sources used for this study are restricted to the OK. It must be borne in mind that all sources, whether contemporaneous or later, may contain scribal errors,[3] and that some, such as the Royal Annals, were subject to ideological influence.

Kings before Nar-mer

The earliest writing from Egypt preserves the names of several rulers who preceded Nar-mer, here considered the first king of Dyn. 1.[4] Two

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[1] I would like to thank Eva-Maria Engel and Barbara Kneißler for information and for help in preparing the documents.

[2] Wilkinson, *Annals*; M. Baud, "Les frontières des quatre premières dynasties. Annales royales et historiographie égyptienne," *BSFE* 149 (2000), 32–46; idem, "Ménès", 109–147.—Schäfer, *Annalen*, remains the fundamental publication for the Palermo Stone, the largest fragment of annals that has survived.

[3] E.g. the labels Petrie, *RT I*, pl. 15: 16–17 where the meaning of the eponymous event was misunderstood—see G. Dreyer et al., "Umm el-Qaab, Nachuntersuchungen im frühzeitlichen Königsfriedhof, 11./12. Vorbericht," *MDAIK* 56 (2000), 116 n. b; or, for the reign of Den, an entry in the Annals (Cairo Fragment 5, recto, lower part, 5) mentioning the planning (?) of a building which must have been erected under Djer, cf. Wilkinson, *Annals*, 246–247.

[4] Recent scholarship favours Narmer over ʿAha for the role of Menes, first king of

of them are documented in the necropolis of This at Umm el-Qaab, Abydos: Iry-Hor and Sekhen/Ka.[5] Archaeological evidence makes Sekhen/Ka the predecessor of Nar-mer and thus a successor of Iry-Hor.[6] The presence of the element Hor in the name Iry-Hor can be cited in support of this interpretation, since the names of some other "kings" attested before Nar-mer also include the god's name: Ny-Hor, Hat-Hor, and Pe-Hor. These "kings," as well as some others, are presumed to have been local rulers or rulers who opposed the Thinite elite. Information for determining the chronological relationship of these rulers is provided solely by archaeological evidence.[7] The following names are attested:

Ny-Hor, at Tura[8]
Hat-Hor, at Tarkhan[9]
"Trio" (three circles surmounting vertical strokes), from the eastern Delta,[10] and perhaps also at Tura[11]
Pe-Hor (alternatively read Iry-Hor and thus assignable to him), at Qustul[12]
Ny-Neit(?), at Helwan[13]
"Crocodile", at Tarkhan[14]
"Bird and vertical sign", at Tarkhan[15]

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the First Dynasty; cf. Kitchen, *RITA* II, 533–534. Support for this interpretation is provided by Docs. 1 and 2 (see infra); cf. L. Morenz, "Gegner des Narmer aus dem Papyrus-Land: *NW* and *Wꜥ-Š*, *GM* 189 (2002), 88. Baud, "Ménès", 109–110, provides a summary of the arguments pro and contra both Nar-mer and ʿAha.

[5] Both readings are possible; see Kahl, *System*, 38–40.

[6] W. Kaiser & G. D. Dreyer, "Umm el-Qaab, Nachuntersuchungen im frühzeitlichen Königsfriedhof, 2. Vorbericht," *MDAIK* 38 (1982), 238.

[7] See J. Kahl, "Hieroglyphic Writing during the Fourth Millennium BC: An Analysis of Systems," *Archéo-Nil* 11 (2001), 106, fig. 3, and cf. W. Kaiser & G. Dreyer, *MDAIK* 38 (1982), 260–69; T. von der Way, *Untersuchungen zur Spätvor- und Frühgeschichte Unterägyptens* (Heidelberg: SAGA 8, 1993), 101.

[8] Junker, *Turah,* 147, fig. 57; Kaiser and Dreyer (n. 6), 260–69.

[9] Kaiser & Dreyer (n. 6), 260–69.

[10] H. G. Fischer, "Varia Aegyptiaca," *JARCE* 2 (1963), 44–47.

[11] Junker, *Turah*, 46–47, fig. 57; cf. Fischer (n. 10); von der Way (n. 7), 101.

[12] B. B. Williams, *The A-Group Royal Cemetery at Qustul: Cemetery L* (Chicago: OINE III, 1986), 163, pl. 76.

[13] Identified in an inscription on a jar uncovered by Z. Y. Saad at Helwan in 1949 or 1950: E. C. Köhler & E. C. M. van den Brink, "Four Jars with Incised *Serekh*-Signs from Helwan Recently Retrieved from the Cairo Museum," *GM* 187 (2002), 65–66, 76 fig. 1: 2, 77 fig. 2: 2.

[14] G. D. Dreyer, "Horus Krokodil, ein Gegenkönig der Dynastie O," in: *The Followers of Horus. Studies Dedicated to Michael Allen Hoffmann 1944–1990*, R. Friedman & B. Adams, eds. (Oxford: ESAP 2, 1992), 259–63.

[15] W. M. F. Petrie, *Tarkhan I and Memphis V* (1913), pl. 31:71; Dreyer (n. 14), 260.

"Scorpion", at Hierakonpolis[16]
a ruler with an obscure name, at Buto[17]

Not included in this list is a group of signs consisting of two falcons on a *serekh* ("Double Falcon"), known from Abydos, Tura, Beda, and the Sinai.[18] Whether it represents a king's name or is symbolic of royal authority per se, remains open. Several groups of signs on labels and in inscriptions on vessels from Tomb U-j at Umm el-Qaab, as well as signs on the Min colossi from Coptos, on the Libya Palette and on some other small finds, have been understood as kings' names.[19] But this interpretation is problematic.[20] The groups may be place names and/or the names of gods instead.[21]

Nar-mer to Qa-ʿa: The Succession

Inscriptions preserved in seal impressions and on stone vessels have established a highly reliable model for the succession during Dyn. 1. Impressions of two different seals associated with the administration of the necropolis were found in the royal cemetery of Umm el-Qaab, Abydos. Both seals listed kings who were buried there. One dates from the time of Den or ʿAdj-ib (Doc. 1); the other is temp. Qa-ʿa or Hetep-sekhemwy (Doc. 2). According to Werner Kaiser, whose interpretation

[16] Quibell, *Hierakonpolis I*, pl. 25 (bottom), 26c; cf. G. Dreyer, "Ein Siegel der frühzeitlichen Königsnekropole von Abydos," *MDAIK* 43 (1987), 41–42; W. Kaiser, "Zum Siegel mit frühen Königsnamen von Umm el-Qaab," *MDAIK* 43 (1987), 116–17; Helck, *Thinitenzeit*, 92; W. Kaiser, "Zur Entstehung des gesamtägyptischen Staates," *MDAIK* 46 (1990), 291 n. 23.

[17] Von der Way (n. 7), 99, fig. 22: 6.

[18] For documentation and discussion see E.-M. Engel, "Ein weiterer Beleg für den Doppelfalken auf einem Serech," in press; Junker, *Turah*, 47 fig. 57; J. Cledat, "Les vases de El-Béda," *ASAE* 13 (1914), 119 figs. 3–4, 120 fig. 6; E. D. Oren, "Sinai," *The New Encyclopedia of Archaeological Excavations in the Holy Land*, E. Stern, A. Levinson Gilboa & J. Aviram, eds., vol. 4 (Jerusalem, 1993) 1388; Kaiser & Dreyer (n. 6), 260–269.

[19] G. Dreyer, *Umm el-Qaab I. Das prädynastische Königsgrab U-j und seine frühen Schriftzeugnisse* (Mainz: AV 86, 1998), 178–80.

[20] See B. J. Kemp, "The Colossi from the Early Shrine at Coptos in Egypt," *Cambridge Archaeological Journal* 10 (2000), 211–242; J. Kahl, "Das Schlagen des Feindes von Hu: Gebel Tjauti Felsinschrift 1," *GM* 192 (2003), 47–54. J. Baines, "The earliest Egyptian writing: development, context, purpose", in: S. D. Houston, ed., *The First Writing. Script Invention as History and Process* (Cambridge, 2004), 150–189.

[21] So J. Kahl, "Die frühen Schriftzeugnisse aus dem Grab U-j in Umm el-Qaab," *CdE* 78 (2003), 112–135.

is followed here, the metal cylinder seal used to make the impressions subsumed under Doc. 1 was cut during the reign of Den and altered after his death.[22] This accounts for the unsymmetrical sequence of kings' Horus names (written without *serekhs*)[23] and the name of the god Khent-imenty. The royal names are arranged from left to right: Nar-mer—ʿAha—Djer—"Serpent"—Den—Meret-neit. (The sequence Djer—"Serpent"—is confirmed by Doc. 3, see infra.). Social, rather than chronological reasons dictated that Meret-neit follows Den; as king's mother, her status was lower than her son's.[24] This interpretation is supported by the material (limestone)[25] of the stelae for her tomb at Umm el-Qaab and by seal impressions found there which are closer to those from the time of "Serpent" than to those temp. ʿAdj-ib.[26] That Meret-neit is presumed to have served as regent for her son accounts for her burial among the kings at Umm el-Qaab.[27] Accordingly, the chronological order should be Nar-mer—ʿAha—Djer—"Serpent"—Meret-neit—Den.

Several impressions from sealings of leather bags facilitated the reconstruction of a second cylinder seal, Doc. 2. Its design is similar to that of Doc. 1. Again, there are no serekhs. The sequence of kings' names from Nar-mer to Qa-ʿa is reversed, with mention of Khent-imenty, perhaps as tutelary deity of the necropolis.[28] Meret-neit is omitted, probably because of her lower status.[29] The royal names, arranged from left to right, are: Qa-ʿa—Semer-khet—ʿAdj-ib—Den—"Serpent"—Djer—ʿAha—Nar-mer.

Inscriptions on stone vessels corroborate the succession Den—ʿAdj-ib—Semer-khet—Qa-ʿa (Docs. 4–8) or segments of it (Docs. 9–13, 15–17). Paleographical analysis shows that kings' names were added from reign to reign. Sometimes ʿAdj-ib's name was erased (Docs. 10–11;

[22] Kaiser (n. 16, 1987), 119.

[23] Dreyer (n. 16), 35, argues that this was intended to designate the rulers in question as deceased.

[24] So both Dreyer (n. 16), 37, and Kaiser (n. 16, 1987), 118 n. 13.

[25] Not one of the hard stones (grano-diorite, granite, or basalt) used for kings' stelae since the reign of Den; cf. Fischer (n. 10), 41–43.

[26] Kaplony, *Inschriften I*, 495–496.

[27] A seal impression from Saqqara, tomb S 3503 may name Djer and Meret-neit; cf. W. B. Emery, *Tombs II*, 169 (2), fig. 226; Kaplony, *Inschriften II*, 1183 (730); *III*, fig. 730; Helck, *Thinitenzeit*, 101.

[28] Dreyer et al., "Umm el-Qaab. Nachuntersuchungen im frühzeitlichen Königsfriedhof, 7./8. Vorbericht," *MDAIK* 52 (1996), 73.

[29] So Dreyer et al. (n. 28), 72.

cf. Doc. 15). Only a few of the inscriptions on these vessels use Horus names; in most cases they mention instead the *nsw bjt nb.tj* title + name.[30] Because other contemporaneous inscriptions give both names of a king, it is possible to equate Horus Den with *nsw-bjt* Khasty,[31] Horus ʿAdj-ib with *nsw bjt nb.tj* Mer-pi-bia,[32] Horus Semerkhet with *nsw bjt nb.tj* Iry-netjer[33] and also with a second unreadable *nsw bjt nb.tj* name,[34] and, finally, Horus Qa-ʿa with *nsw bjt nb.tj* Sen,[35] *nsw bjt nb.tj* Sehetep[36] and *nsw bjt nb.tj* Qa-ʿa.[37]

The three *nsw bjt nb.tj* names of Qa-ʿa can be interpreted as indicative of chronologically different periods of his reign. According to this proposal, Sen is the oldest of the three. On year labels of *Qa-ʿa*,[38] Sen is associated with the official Henu-ka[39] who is documented under Qa-ʿa's predecessor Semer-khet.[40] The *nsw bjt nb.tj* name Sen and the official Henu-ka are both mentioned in connection with a "Sixth Occasion of Inspection"; another document citing the same event mentions the *nsw bjt nb.tj* Sehetep.[41] Therefore, Sehetep will have replaced

[30] For the controversy about whether the element *nb.tj* belongs to the name or to the title, cf. Wilkinson, *Egypt*, 206–207.

[31] Label, Umm el-Qaab, Tomb T: Petrie, *RT I*, 22, 40–42, pls. 11: 14, 15: 16; Helck, *Thinitenzeit*, 101, 123, 159, 169–170, 172–174, 188, 234; seal impression, Umm el-Qaab, Tomb T: Petrie, *RT II*, pl. 19: 151; Kaplony, *Inschriften I*, 127; *II*, 807 (730); seal impression, Umm el-Qaab, Cemetery T (?): Kaplony, *Inschriften II*, 1104 (83); *III*, fig. 83; seal impression, Umm el-Qaab, Tomb T: Petrie, *RT II*, 25, 49, pl. 7: 5–6; Kaplony, *Inschriften II*, 1142 (364); III, fig. 364; label, Umm el-Qaab: G. Godron, *Études sur le Horus Den et quelques problèmes de l'Égypte archaique* (Geneva, 1990), pls. 1: 1—3: 6; seal impression, Saqqara, Tomb S 3506: Emery, *Tombs III*, 68–69 (18), pl. 79: 18; Kaplony, *Inschriften II*, 1118 (196); *III*, fig. 196; Helck, *Thinitenzeit*, 191; seal impression, Abu Roash, Tomb M XII: P. Montet, "Tombeaux de la Ire et de la IVe dynasties à Abou-Roach (deuxième partie)—Inventaire des objets," Kêmi 8 (1946), 205–12, pl. 14; Kaplony, *Inschriften I*, 135 (W); *III*, fig. 195; Helck, *Thinitenzeit*, 191.

[32] Seal impression, Umm el-Qaab, Tomb X: Kaplony, *Inschriften III*, fig. 245.

[33] Seal impression, Umm el-Qaab, Tomb U: Kaplony, *Inschriften III*, fig. 229.

[34] Label, Umm el-Qaab, Tomb Q: E.-M. Engel, *Das Grab des Qaʿa in Umm el-Qa'ab: Architektur und Inventar* (Diss., microfiche, Göttingen 1997), 437, fig. 217: 5; label, Umm el-Qaab, Tomb Q: Dreyer (n. 28), 73–74, pl. 14d.

[35] Three labels, Umm el-Qaab, Tomb Q: Petrie, *RT I*, pl. 17: 29; Petrie, *RT II*, pl. 8: 3, 12: 6; Petrie, *Abydos* I, pl. 11: 11.

[36] Label, Umm el-Qaab, Tomb Q: Dreyer (n. 28), 74–75, pl. 14e.

[37] Stone vessel, prov. not known: Kaplony, *Steingefässe*, 26–32, pls. 4, 20 (32).

[38] Labels from Umm el-Qaab, Tomb Q: Engel (n. 34), 455, figs. 221: 1 and 4.

[39] Cf. Kaplony, *Inschriften I*, 579.

[40] Cf. labels from his reign: Engel, (n. 34), 437, fig. 217: 1; Petrie, *RT II*, pl. 8: 5.

[41] Two labels, Umm el-Qaab, Tomb Q: Engel (n. 34), 455, figs. 221: 1 and 4 (Sen); label, Umm el-Qaab, Tomb Q: Dreyer (n. 28), 74–75, pl. 14e (Sehetep).

Sen in that year. The "Sixth Occasion of Inspection" could not have taken place before the king's sixth year.[42] The new *nsw bjt nb.tj* name Qa-ʿa for the king is the youngest because it is associated with his *sed*-festivals.[43]

The style and content of inscriptions attesting two enigmatic kings (Horus Senefer-ka[44] and Horus "Bird")[45] date them to the time of Qa-ʿa or slightly later.[46] Three explanations are possible: (a) Senefer-ka and "Bird" were rivals of Qa-ʿa. At the beginning of his reign, Qa-ʿa had the "peaceful" name Sen, "the one who fraternizes." The change to Sehetep, "the one who pacifies" and to Qa-ʿa "the one with raised arm" reflect political developments, viz. Qa-ʿa opposition to and eventual victory over two opponents. This alternative is favoured here. (b) The names Senefer-ka and "Bird" are also names of Qa-ʿa; i.e., he also changed his Horus name in the course of his reign.[47] (c) The names belong to rulers who reigned after Qa-ʿa died. The brevity of their reigns did not permit either to arrange for Qa-ʿa's burial nor were any seals cut. Seal impressions found in Tomb Q at Umm el-Qaab leave no doubt that Hetep-sekhemwy buried Qa-ʿa there.[48]

Evidence for the Lengths of Reigns during Dyn. 1

During the Early Dynastic Period a regnal year was not numbered but identified by one or more specific significant events occurring in its course.[49] This is inferred from the existence of different names for the same year in contemporaneous sources (labels and stone vessels) and confirmed by the information provided by the Royal Annals. Perhaps the use of more than one event resulted from the necessity to "name" a year when it began, at a time when only scheduled festivals and

[42] Presuming that there was only one "occasion" in any given year.

[43] Stone vessel, Umm el-Qaab, Tomb Q: Petrie, *RT I*, pl. 9: 8; stone vessel, private collection: Kaplony, *Steingefässe*, 26–32, pls. 4, 20 (12).

[44] Lauer, *Pyramide IV.1*, pl. 17: 86; Emery, *Tombs III*, pl. 38: 1; Kaplony, *Steingefässe*, 33 (13).

[45] Petrie, *RT II*, pl. 8A: 6; Lauer, *Pyramide IV.1*, pl. IV: 17.

[46] For the sake of completeness, mention should be made of a seal impression from Tomb S 3505 at Saqqara which preserves traces of an otherwise unknown Horus name; see Kaplony, *Inschriften I*, 147, 149; *III*, fig. 742.

[47] Cf. Lauer, *Pyramide IV.1*, 15 (86), with reference to the name Senefer-ka.

[48] Dreyer (n. 28), 71.

[49] Cf. Baud, "Ménès", 109–147; idem, *BSFE* 149 (2000), 32–46.

ritual or cultic events could be selected to identify the year. At year's end, events unforeseen at its beginning, such as expeditions or campaigns, could have been chosen and cited retrospectively.[50] In general, isolated eponymous events are unsuitable for determining the sequence of regnal years, by contrast to *sed* festivals and other recurring events. Even if *sed* festivals were celebrated for the first time before regnal year 30,[51] mention of one suggests a point later, rather than earlier in a given reign. A *sed* festival is documented for Den[52] and ʿAdj-ib;[53] Qa-ʿa celebrated a second.[54] Other eponymous events which took place repeatedly are also suggestive of a long reign. Examples are the "Sixth Inspection" mentioned above and a "Second Running of Apis" during the reign of Qa-ʿa.[55] However, it is not known whether these events occurred at regular intervals. Thus they provide only a vague idea of reign length at best.

The Royal Annals, which survive on fragments in Palermo, Cairo and London,[56] list entries for every year of Semer-khet's reign (cf. infra). For other kings, only some years are preserved.

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[50] Similarly, Dreyer, *MDAIK* 56 (2000), 116 n. a.

[51] Hornung & Staehelin, *Sedfest*, 62–63.

[52] Label, Umm el-Qaab, Tomb T: Petrie *RT*, I, 21–22, 40–41, pls. 11: 5, 14: 12; Helck, *Thinitenzeit*, 71, 123, 160, 169–70, 215; label, Umm el-Qaab, Tomb T: G. Dreyer, *MDAIK* 46 (1990), 80, pl. 26a. The mention of a second *sed* festival without a king's name on the fragment of a stone vessel from Umm el-Qaab, Tomb T (Dreyer, *MDAIK* 46 (1990), 80, fig. 9 and pl. 26d) may refer to Den; alternatively, the fragment may be an intrusive find from the tomb of ʿAdj-ib, of Semer-khet or—most probably—of Qa-ʿa.

[53] Stone vessel, Step Pyramid, Gallery H: Lauer, *Pyramide IV.1*, pl. III: 7; IV.2, 19–20 (35); Helck, *Thinitenzeit*, 123–124; stone vessel, Umm el-Qaab, Tomb X, Q, U: Lauer, *Pyramide IV.1*, pl. III: 6; IV.2, 20; Petrie, *Abydos I*, pl. 5 (upper left); idem, *RT I*, 20–21, 39–40, pls. 6: 2, 7: 5 and 10, 8: 11; Helck, *Thinitenzeit*, 123, 192, 228; stone vessel, Saqqara, Tomb S 2446: Quibell, *Archaic Mastabas* (Cairo, 1923), 13, 41, pl. 33: 5; Lauer, *Pyramide IV.1*, pl. III: 4; IV.2, 20. Cf. K. O. Kuraszkiewicz, "Noch einmal zum zweiten Sedfest des Adjib," *GM* 167 (1998), 73–75.

[54] *Sed* festival: stone vessel from Umm el-Qaab, Tomb Q: Petrie, *RT I*, 20–21, 40, pl. 8: 7–7a; second stone vessel from Tomb Q: Petrie, *RT I*, pl. 9: 8; stone vessel from the Step Pyramid, outside Galleries H and B: Lauer, *Pyramide IV.1*, pl. IV: 4; IV.2, 24–25 (42); stone vessel in a Swiss private collection: Kaplony, *Steingefässe*, 34–38 (16), pl. 5: 22.

Second *sed*-festival: stone vessel from Saqqara, Step Pyramid, outside Galleries H and B: Lauer, *Pyramide IV.1*, pl. IV: 5; IV.2, 25 (43); another stone vessel from the Step Pyramid, Gallery B: Lauer, *Pyramide IV.1*, pl. 8: 41; IV.2, 24 (41); stone vessel in a Swiss private collection: Kaplony, *Steingefässe*, 26–32, pls. 4, 20 (12).

[55] Label, Umm el-Qaab, Tomb Q: Engel (n. 34), 464, fig. 224.

[56] See note 2, above.

ʿAha: highly probable x+2 years (end of his reign)[57] and probably x+5+y years (later years of his reign)[58]
Djer: highly probable 10+y years (beginning of his reign)[59] and x+9+y years (middle of his reign)[60]
Den: x+6+y years (middle of his reign)[61] and highly probably x+14+y years (later years of his reign)[62]
ʿAdj-ib: x+2 years (end of his reign)[63]
Semer-khet: 9 years (his complete reign)[64]
Qa-ʿa: 2+y years (beginning of his reign)[65]

Reconstructions of the Annals differ widely and must be considered highly speculative. Here statements about hypothetical reign lengths are disregarded.[66] The possibility cannot be ignored that Nar-mer's reign was also recorded in the annals, especially now following on the discovery of a label at Umm el-Qaab citing one of his years.[67]

Table II. 2.1. The kings from Nar-mer to Qa-ʿa

Horus Names	*nsw bjt nb.tj* Names	Sed Festivals	Other Rulers
Nar-mer			
ʿAha			
Djer			
« Serpent »			
			Meret-neit
Den	Khasti	one	
ʿAdj-ib	Mer-pi-bia	one	
Semer-khet	Iry-netjer and an unreadable name		
Qa-ʿa	Sen		
	Sehetep		Senefer-ka, "Bird"
	Qa-ʿa	two	

57 Palermo Stone, recto, II: 1–2; cf. Wilkinson, *Annals*, 90–91, fig. 1.
58 Cairo fragment 5, recto, upper register; cf. Wilkinson, *Annals*, 238–40, fig. 10.
59 Palermo Stone, recto, II: 3–12; cf. Wilkinson, *Annals*, 90, 92–103, fig. 1.
60 Cairo fragment 1, recto, II; cf. Wilkinson, *Annals*, 186–93, fig. 4.
61 Cairo fragment 5, recto, lower register; cf. Wilkinson, *Annals*, 240–47, fig. 10.
62 Cf. Wilkinson, *Annals*, 103–19, fig. 1; Baud, *BSFE* 149 (2000), 37.
63 Cairo fragment 1, recto, III: 1–2; cf. Wilkinson, *Annals*, 193–94, fig. 4.
64 Cairo fragment 1, recto, III: 3–11; cf. Wilkinson, *Annals*, 194–201, fig. 4.
65 Cairo fragment 1, recto, III: 12–13; cf. Wilkinson, *Annals*, 201–202, fig. 4.
66 For an instructive overview, see Wilkinson, *Annals*, 256–57.
67 Dreyer, *MDAIK* 54 (1998), 139, fig. 29 and pl. 5c.

Hetep-sekhemwy to Netjery-khet:[68] *The Succession*

The sequence of three Dyn. 2 kings is secure: Hetep-sekhemwy, who buried Qa-ʿa at Umm el-Qaab[69]—Raʿ-neb—Ny-netjer. The inscription on the shoulder of CG 1 (Doc. 18), a statue depicting a kneeling man (presumably a priest), lists these Horus names in that order. Additional support for the sequence is provided by inscriptions on stone vessels in different hands mentioning Hetep-sekhemwy and Raʿ-neb (Docs. 19, 20).[70] In an inscription mentioning the *ka*-house of Hetep-sekhemwy on another stone vessel from the Step Pyramid (Doc. 21), the name Ny-netjer is written over an erased name. This document, along with the inscribed fragment of a stone vessel from the tomb of Per-ibsen (Doc. 22), substantiates the sequence on the statue Doc. 18. (During Ny-netjer's reign, Raʿ-neb's name was erased several times; see Doc. 20, 21 (?), 22.)[71]

nsw bjt nb.tj Weneg[72] is attested only by inscriptions on stone vessels found in the Step Pyramid and in Tomb S 3014.[73] Weneg's exact position, as well as the identification of his Horus name among those known, has remained open until now.[74] A long-known inscription from Tomb P at Umm el-Qaab (Doc. 22) provides the key to solving some of the problems associated with Weneg.[75] In the inscription the *nsw bjt nb.tj* name Ny-netjer faces the opposite direction from the name of Raʿ-neb and that of his palace (Fig. II. 2.1). Raʿ-neb's name is partially erased.

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[68] Here and below the Horus name Netjery-khet is used to identify the first king of Dynasty 3, in preference to Djoser, since the latter is not documented in contemporaneous texts.

[69] See n. 48, above.

[70] For the sequence Hetep-sekhemwy—Raʿ-neb, cf. the arguments of H. G. Fischer, "An Egyptian Royal Stela of the Second Dynasty," *Artibus Asiae* 24 (1961), 47–48 with n. 11.

[71] A stone vessel inscribed with the names of Qa-ʿa and Raʿ-neb (Kaplony, *Steingefässe*, 34–38 (16), pl. 5: 22) does not help to reconstruct the order of these kings.

[72] For the reading, cf. B. Grdseloff, "Notes d'épigraphie archaique," *ASAE* 44 (1944), 288–291.

[73] Lauer, *Pyramide IV.1*, pls. V: 4, 19: 105, 20: 101–103 and 106–107; IV.2, 50–53.

[74] Helck, *Thinitenzeit*, 103, proposed to identify him with the enigmatic Horus Sa, known from the mention of his *Ka*-house in inscriptions on stone vessels from the Step Pyramid; cf. Lauer, *Pyramide V*, 7–8, pls. 6–7; Helck, "Die Datierung der Gefässaufschriften aus der Djoserpyramide," *ZÄS* 106 (1979), 124.

[75] See the excellent photo published in the exhibition catalogue *Kemet alle sorgenti del tempo*, A. M. Donadoni Roveri & F. Tiradritti, eds. (Milan, 1998), 251.

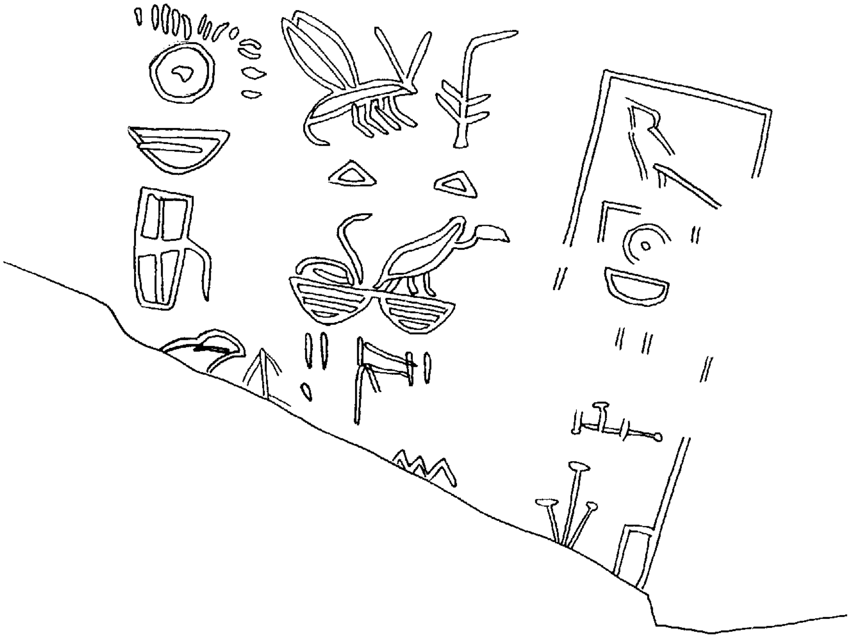


Fig. II. 2.1. Inscription on stone vessel fragment BM EA 35556
(drawing after photo: E.-M. Engel)

Scrutiny of the inscription reveals that the name Ny-netjer is written over Weneg. Traces of the plant sign used to write Weneg are discernible, as are the enigmatic strokes to the upper left and right of it (Fig. II. 2.2) which are also attested in another of his inscriptions.[76] Thus Ny-netjer must have been Weneg's successor, and the original inscription referred to the palace of Horus Raʿ-neb and to *nsw bjt nb.tj* Weneg. Therefore the Horus name of *nsw bjt nb.tj* Weneg should be Ra-neb.

nsw bjt nb.tj Nub-nefer is attested only on two stone vessels from the Step Pyramid (Docs. 23, 24).[77] Both inscriptions mention him in connection with a building called Ḥwt-mn.t-ʿnḫ. Another stone-vessel inscription associates this structure with the Gold name Ren.[78] The Palermo

[76] Lauer, *Pyramide IV.1*, pl. 20: 104; IV.2, 50.
[77] Lauer, *Pyramide IV.1*, pl. VI: 3–4.
[78] Lauer, *Pyramide IV.1*, pl. 19: 98.

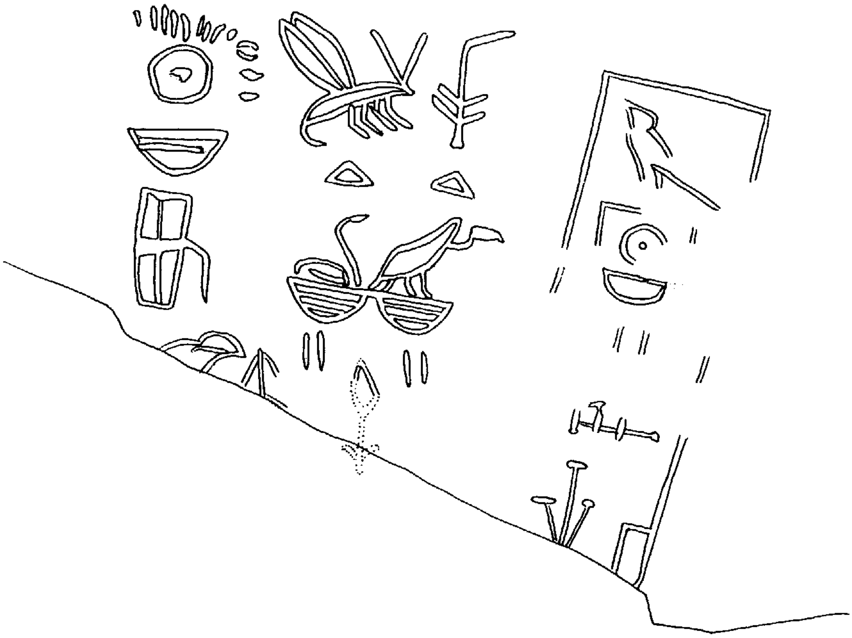


Fig II.2.2. Reconstruction of the king's name as originally written on BM EA 35556 (drawing: E.-M. Engel)

Stone gives Ren as Ny-netjer's Gold name.[79] Nub-nefer's reign should therefore be in proximity to Ny-netjer's. Currently there are two options for his dynastic position. Either Nub-nefer was Raʿ-neb's *nsw bjt nb.tj* name[80] or he was an ephemeral ruler who occupied the throne briefly after Ny-netjer's death.[81] The evidence just presented for identifying Weneg as Raʿ-neb's *nsw bjt nb.tj* name shows that the second alternative is correct. Kaiser's suggestion that *nsw bjt* Sened was the last king to reign over UE and LE before Kha-sekhemwy is very plausible.[82] Circumstantial evidence for this sequence is the survival of the funerary cult of Sened into Dyn. 4.[83] *nsw bjt* Sened or *nsw bjt nb.tj* Nub-nefer

[79] Recto, IV.

[80] So Gunn, "Inscriptions from the Step Pyramid site III. Fragments of inscribed Vessels," *ASAE* 28 (1928), 156 n. 2; idem, *ASAE* 44 (1944), 292; cf. Beckerath, *Handbuch*, 48.

[81] Helck (n. 74, Datierung), 131–32; Wilkinson, *Egypt*, 89.

[82] "Zur Nennung von Sened und Peribsen in Sakkara B 3," *GM* 122 (1991), 49–55.

[83] In the tomb of Shery, Saqqara B 3: A. Mariette, *Les mastabas de l'ancien empire* (Paris, 1889), 92–93; A. Moret, "Fragments du mastaba de Shery, prêtre des rois Peribsen et Send," *Monuments Piot* 25 (1921/22), 273–98.

might be identical with Horus Sa, who is known from the mention of his *ka*-house in inscriptions on stone vessels from the Step Pyramid.[84]

It is not clear whether the next two names—Horus Sekhem-ib and Seth Per-ibsen—belonged to a single ruler or to two different kings. Per-ibsen certainly claimed to rule over all of Egypt,[85] but the sources do not confirm this. Contemporaneous evidence for Seth Per-ibsen is restricted to UE between Elephantine and Beit Khallaf, just north of Abydos,[86] except for his funerary cult in association with *nsw bjt* Sened at Saqqara.[87] Sekhem-ib is attested at Abydos and Saqqara. Seal impressions mentioning Sekhem-ib come from the tomb of Per-ibsen, while at Saqqara, stone vessels with Sekhem-ib's name were found in the Step Pyramid. But this does not prove that Sekhem-ib exercised influence in the Memphite region, since these vessels could have been brought to Saqqara from Abydos after Sekhem-ib's death. Theories about the relationship between the names Sekhem-ib and Per-ibsen[88] suggest that (a) Sekhem-ib and Per-ibsen were names borne simultaneously by a single king;[89] (b) Horus Sekhem-ib was the older name of Seth Per-ibsen;[90] (c) Horus Sekhem-ib buried Seth Per-ibsen and was thus his successor.[91] Down to the present there is no compelling argument favouring one alternative over the others.

The last king of Dyn. 2 was Horus-Seth Kha-sekhemwy. His power base seems to have been Hierakonpolis where he is attested as victor over northern enemies under the name Horus Kha-sekhem.[92] Presumably

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[84] Cf. note 74 above and M. J. Raven, "Les fouilles de Leyde dans la tombe de Mérytneith à Saqqara. Campagnes 2001–2002," *BSFE* 155 (2002), 31.

[85] Kaplony, *Inschriften III*, fig. 368; cf. Kahl, *System*, 83–84.

[86] Cf. Kahl, *System*, 356–58 (Quellen 2887–2914).

[87] In the tomb of Shery, see note 83, above. Kaiser considers dynastic and political reasons that might have led to the institution of Per-ibsen's cult under Kha-sekhemwy.

[88] Cf. Schneider, *Lexikon*, 405; Wilkinson, *Egypt*, 90–91.

[89] E.g., Grdseloff, *ASAE* 44 (1944), 295.

[90] E.g., E. Drioton & J. Vandier, *L'Égypte*^{4} (Paris, 1962), 164.

[91] E.g., Helck, *Thinitenzeit*, 103–104.

[92] Cf. the statues Cairo JE 32161 (Quibell, *Hierakonpolis I*, 11, pls. 40 (upper), 41 (left); Quibell & Green, *Hierakonpolis II* (London, 1902), 27–28, 44) and Oxford Ashmolean Museum E 517 (Quibell, *Hierakonpolis I*, 11, pls. 39, 40 (bottom); Quibell & Green, *Hierakonpolis II*, 31, 43–44. See now H. Sourouzian, "L'iconographie du roi dans la statuaire des trois premières dynasties," in: *Kunst des Alten Reiches. Symposium im Deutschen Archäologischen Institut Kairo am 29. und 30. Oktober 1991* (Mainz: DAIKS 28, 1995), 141–43, pl. 51. Cf. also the following stone vessels: Cairo CG 14724: Quibell, *Hierakonpolis I*, pl. 38 (upper); P. Kaplony, "Bemerkungen zu einigen Steingefässen mit archaischen Königsnamen," *MDAIK* 20 (1965), 26 (53), pl. 6; Helck, *Thinitenzeit*, 72, 106–107; J. Baines, *Fecundity Figures. Egyptian Personification and the Iconology of a Genre* (Warminster,

later in his reign, Kha-sekhem took the Horus-Seth name Kha-sekhemwy to demonstrate that peace and harmony had been restored through his actions.[93] Considerable circumstantial evidence exists for Horus Netjery-khet as the successor of Kha-sekhemwy: (a) a seal with the names of officials used once together with a seal of Kha-sekhemwy and then with a seal of Netjery-khet (Doc. 25); (b) Ny-maat-Hep,[94] mother of the royal children and king's mother (of Netjery-khet) is attested on seal impressions in Kha-sekhemwy's tomb at Umm el-Qaab as well as in Tomb K1 at Beit Khallaf (Doc. 26a–b); (c) many seal impressions naming Netjery-khet which come from Kha-sekhemwy's tomb.[95]

The following Horus names of Dyn. 2 can be associated with *nsw bjt nb.tj* names or *nbw*-names:

Horus Hetep-sekhemwy: *nsw bjt nb.tj* Hetep[96]
Horus Raʿ-neb: *nsw bjt nb.tj* Weneg (see P. 102–103, above)
Horus Ny-netjer: *nsw bjt nb.tj* Ny-netjer,[97] *nbw* Ren[98]
Horus Sekhem-ib(-Per-en-maat): *nsw bjt nb.tj* Sekhem-ib-Per-en-maat[99]
Seth Per-ibsen: *nsw bjt/nsw bjt nb.tj* Per-ibsen[100]
Horus-Seth Kha-sekhemwy(-Hetep-netjerwy-imef): *nsw bjt nb.tj* Kha-sekhemwy-Hetep-netjerwy-imef[101]/Kha-sekhemwy-Nub-khetsen[102]

1985), 245; B.G. Aston, *Ancient Egyptian Stone Vessels: Materials and Forms* (Heidelberg: SAGA 5, 1994), pl. 2a; Philadelphia, Penn. Univ. Mus. E 3958: Quibell, *Hierakonpolis I*, pl. 38 (bottom); Helck, *Thinitenzeit* 72, 106–107; Baines, *Fecundity Figures*, 245; Oxford, Ashm. Mus. No. not known: Quibell, *Hierakonpolis I*, pl. 37 (middle, right); Helck, *Thinitenzeit*, 72, 106–107. Presumably also from Hierakonpolis are: Saqqara, no. 662: Lauer, *Pyramide IV.1*, pl. 3: 18; IV.2, 8 (18); Helck (n. 74, Datierung), 132 n. 7; private collection: Kaplony, *MDAIK* 20 (1965), 24, 26, fig. 54.

[93] Cf., e.g., Wilkinson, *Egypt*, 91–92.

[94] See S. Roth, *Die Königsmütter des Alten Ägypten von der Frühzeit bis zum Ende der 12. Dynastie* (Wiesbaden: ÄAT 46, 2001), 59–67.

[95] See, for the moment, Dreyer, "Der erste König der 3. Dynastie," *Stationen*, 31–34.

[96] Seal impressions: Kaplony, *Inschriften III*, figs. 281–82.

[97] Presuming identical Horus and *nsw bjt nb.tj* names imply identity; for the latter, see Lauer, *Pyramide IV.1*, pl. 15: 73.

[98] Palermo Stone, recto, IV.

[99] Again, presuming identical Horus and *nsw bjt nb.tj* names imply identity; for the latter, see Lauer, *Pyramide IV.1*, pl. 18: 87–94.

[100] As the preceeding. For *nsw bjt* Per-ibsen, cf. Kaplony, *Inschriften III*, fig. 368; for *nsw bjt nb.tj* Per-ibsen, cf. Petrie, *RT I*, pl. 4: 7.

[101] As the preceeding. For *nsw bjt nb.tj* Hetep-netjerwy-imef, cf. Kaplony, *Inschriften III*, fig. 214

[102] As the preceeding. For this *nsw bjt nb.tj* name, cf. W. M. F. Petrie, *Tombs of the Courtiers and Oxyrhynkhos* (London, 1925), pl. 8: 18.

The Lengths of the Reigns of Dyn. 2-kings

Contemporaneous sources yield comparatively little information about the duration of reigns during Dyn. 2. Some stone vessels from the Step Pyramid bear inscriptions citing specific events.[103] One of them mentions the "Fourth Occasion of the Sokar Festival" (probably year 24);[104] another, the "Seventeenth Occasion (of the cattle count)" (probably year 34).[105] These dates have been ascribed to Ny-netjer, since he seems to have been the only ruler of the dynasty to have reigned more than 30 years.[106] For the same reason, inscriptions mentioning a *sed* festival are thought to refer to him.[107] The Annals preserve information about three kings of Dyn. 2: Ny-netjer, years 6–21[108] and perhaps x + 9 years at the end of his reign;[109] Per-ibsen, 6 + y years from the beginning of his reign;[110] Kha-sekhemwy, perhaps years 3–6[111] and most probably years 12–18 towards the end of his reign.[112]

Chronologically Significant Inscriptions, Dyns 1–3

Doc. 1 5 clay impressions of a cylinder seal
Dyn. 1, reign of Den—ʿAdj-ib
a–c: Abydos, find nos. Ab.K 300, 301a–b
d: Abydos
e: London, UC 188 (provisional no., assigned by Kaplony)

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[103] Lauer, *Pyramide V*, 88–90, (nos. 273–75), figs. 172–74.

[104] Lauer, *Pyramide V*, 88 (no. 273), fig. 172; Helck (n. 74, Datierung), 128; Wilkinson, *Egypt*, 85–86.

[105] Lauer, *Pyramide V*, 88–89 (no. 274), fig. 173; Helck (n. 74, Datierung), 128; Wilkinson, *Egypt*, 86.

[106] Cf. Helck (n. 74, Datierung), 128. Wilkinson, *Annals*, 120, estimates a 39-year reign for Ny-netjer.

[107] Cf. Helck (n. 74, Datierung), 130 and Lauer, *Pyramide V*, 3–7, 59, figs. 6–13: 91. But cf. I. Regulski, who assumes a *sed* festival of Kha-sekhemwy (I. Regulski, "Second Dynasty Ink Inscriptions from Saqqara Paralleled in the Abydos Material from The Royal Museums of Art and History (RMAH) in Brussels", in: S. Hendrickx, R. F. Friedman, K. M. Cialowicz & M. Chlodnicki, eds. *Egypt at its Origins* (Leuven: OLA 138, 2004), 960–967.

[108] Palermo Stone, recto, IV. 1–16; cf. Wilkinson, *Annals*, 119–29, fig. 1.

[109] Cairo fragment 1, recto, IV. 1–9; cf. Wilkinson, *Annals*, 202–206, fig. 4.

[110] Cairo fragment 1, recto, IV. 10–15; cf. Wilkinson, *Annals*, 202–203, 207–208, fig. 4.

[111] London fragment, recto, upper part; cf. Wilkinson, *Annals*, 248–51, fig. 11.

[112] Palermo Stone, recto, V. 1–7; cf. Baud, *BSFE* 149 (2000), 36–38; Wilkinson, *Annals*, 130–36, fig. 1.

Table. II. 2.2. The kings from Hetep-sekhemwy to Netjery-khet

Horus and/or Seth Name	*nsw bjt nb.tj* Name	Gold Name	Sed Festivals
Hetep-sekhemwy	Hetep		
Raʿ-neb	Weneg		
Ny-netjer	Ny-netjer	Ren	one(?)
Sa(?)	Nub-nefer		
	Sened		
Sekhem-ib	Sekhem-ib		
(Per-en-maat) /	(Per-en-maat) /		
Per-ibsen (one ruler?)	Per-ibsen (one ruler?)		
Kha-sekhem /	Kha-sekhemwy		
Kha-sekhemwy	(Hetep-netjerwy-imef /		
(Hetep-netjerwy-imef)	Nub-khetsen)		
Netjery-khet	Netjery-khet	Nub(?)	

Prov.: a-d, Umm el-Qaab, Tomb T; e, not known but probably also Tomb T.

Comment: See Pp. 96–97, above
Bibliography: Kaplony, *Inschriften III*, fig. 809; Dreyer, *MDAIK* 43 (1987), 33–43, pls. 3–5; Kaiser, *MDAIK* 43 (1987), 115–19; Dreyer, *MDAIK* 49 (1993), 61

Doc. 2 several clay impressions of a cylinder seal
Dyn. 2, reign of Hetep-sekhemwy
Abydos, find. nos. Ab.K 1486–1500
Prov.: Umm el-Qaab, Tomb Q

Comment: See Pp. 96–97, above
Bibliography: Dreyer, *MDAIK* 52 (1996), 72–73, fig. 26, pl. 14b–c

Doc. 3 2 fragments of a serpentine bowl
Dyn. 1, reign of Djer—"Serpent"
Berlin, Egyptian Mus. 15453 and Abydos, find no. Ab.K 5089
Prov.: Umm el-Qaab Tomb Z and Tomb T, respectively

Comment: These fragments bear incised Horus names attesting the segment Djer—"Serpent" of the sequence established by Doc. 1.
Bibliography: Petrie, *RT II*, 25, pl. 7: 1; V. Müller et al., "Umm el-

Qaab. Nachuntersuchungen im frühzeitlichen Königsfriedhof. 11./12. Vorbericht", *MDAIK* 56 (2000), 109–10, fig. 22a, pl. 10a.

Doc. 4 schist bowl
Dyn.1, reign of Den, with inscriptions added under ʿAdj-ib—Qa-ʿa
Cairo, Egyptian Museum JE 88345
Prov.: Saqqara, Step Pyramid, Gallery B

Comment: The bowl bears four incised *nsw bjt/nsw bjt nb.tj* names: Khasty, <Mer>-pi-bia, Iry-netjer, and Qa-ʿa.
Bibliography: Lauer, *Pyramide III*, pl. 19: 2; IV.1, 10, pls. I: 7, 4: 21; IV.2, 10–12.

Doc. 5 6 fragments of a schist plate
Dyn. 1, reign of Den, with inscriptions added under ʿAdj-ib—Qa-ʿa
Prov.: Saqqara, Step Pyramid, Gallery H

Comment: The inscriptions record the *nsw bjt/nsw bjt nb.tj* names Khasty, [Mer-pi-]bia, Iry-netjer and <Qa->ʿa.
Bibliography: Firth and Quibell, *The Step Pyramid II* (Cairo, 1935), pl. 105: 3; Lauer, *Pyramide IV.1*, 9–10, pl. 4: 20; IV.2, 9–12; Helck, *Thinitenzeit*, 113, 187.

Doc. 6 2 fragments of a schist bowl
Dyn. 1, reign of Den, with inscriptions added under ʿAdj-ib—Qa-ʿa
Cairo, Egyptian Museum JE 55254–55255
Prov.: Saqqara, Step Pyramid, outside Galleries H and B

Comment: The adjoining fragments bear four incised *nsw bjt/nsw bjt nb.tj* names, Khasty, Mer-pi-bia, Iry-netjer and Qa-ʿa.
Bibliography: Gunn, *ASAE* 28 (1928), 156, 158, pl. I: 2; Firth and Quibell, *Step Pyramid* II, pl. 88: 1; Lauer, *Pyramide IV.1*, 10, pl. 4: 19; IV.2, 9–12; Helck, *Thinitenzeit*, 113, 187.

Doc. 7 calcite bowl
Dyn. 1, reign of Den, with inscriptions added under ʿAdj-ib—Qa-ʿa
Michailidis collection
Prov.: not known

Comment: The bowl bears the *nsw bjt/nsw bjt nb.tj* names Khasty, Mer-pi-bia, Iry-netjer and Qa-ʿa.
Bibliography: Kaplony, *Beschriftete Kleinfunde in der Sammlung Georges Michailidis. Ergebnisse einer Bestandsaufnahme im Sommer 1968* (Istanbul, 1973), 6 (25), pl. 7: 25.

Doc. 8 "pyroxen-syenit" bowl
Dyn. 1, reign of Den, with inscriptions added under ʿAdj-ib—Qa-ʿa
Swiss private collection
Prov.: not known

Comment: The bowl shows four incised *nsw bjt/nsw bjt nb.tj* names: Khasty, Mer-pi-bia, Iry-netjer and Qa-ʿa.
Bibliography: Kaplony, *Steingefässe*, 20–24 (9), pls. 2, 17, 18

Doc. 9 "black stone" (diorite?) bowl
Dyn. 1, reign of Den, with added inscriptions of ʿAdj-ib and Semer-khet
New York, MMA 58.125.2
Prov.: not known (ex. Michailidis collection)

Comment: The bowl shows three inscised *nsw bjt/nsw bjt nb.tj* names: Khasty, Mer-pi-bia and Iry-netjer.
Bibliography: Kaplony, *MDAIK* 20 (1965), 13 (22), pls. 3: 22, 4: 22.

Doc. 10 fragment of a rock crystal bowl
Dyn. 1, reign of Den, with added inscriptions of ʿAdj-ib and Semer-khet
London, BM EA 49278
Prov.: Umm el-Qaab, Tomb T

Comment: Mer-pi-bia, originally incised near the name Khasty (untouched), was erased and replaced by Iry-netjer, documenting the sequence Khasty, Mer-pi-bia, Iry-netjer.
Bibliography: E. Naville, *The Cemeteries at Abydos I* (London, 1914), 35, pls. 8 (lower right), 14: 1; Spencer, *Objects*, 42 (271), pls. 23: 271, 26: 271.

Doc. 11 fragment of a stone vessel
Dyn. 1, reign of Den, with added inscriptions of ʿAdj-ib and Semer-khet

Paris, Louvre E. 11035
Prov.: Umm el-Qaab, Tomb T

Comment: As Doc. 10.
Bibliography: E. Amélineau, *Les nouvelles fouilles d'Abydos 1895–1896*, (Paris 1899), pl. 42; K. Sethe, "Die ältesten geschichtlichen Denkmäler der Ägypter", *ZÄS* 35 (1897), 3; Lauer, *Pyramide IV.2*, 10.

Doc. 12 fragment of a quartz-crystal bowl
Dyn. 1, reign of Den, with added inscription of ʿAdj-ib
Philadelphia, Univ. Mus. E 06847
Prov.: Umm el-Qaab, Tomb U

Comment: The names Khasty and Mer[-pi]-bia are incised on the fragment.
Bibliography: Petrie, *RT I*, 19, 38–39, pl. 5: 9; II, pl. 47: 31.

Doc. 13 fragment of a red limestone bowl
Dyn. 1, reign of Den, with added inscription of ʿAdj-ib
Cairo, Egyptian Museum JE 34378
Prov.: Umm el-Qaab, Tomb T

Comment: The vessel may have originally shown more names than Khasty and Mer-pi-bia.
Bibliography: Petrie, *RT I*, 19, 38–39, pl. 5: 12.

Doc. 14 three adjoining fragments of a calcite vessel
Dyn. 1, reign of Den with added inscription of ʿAdj-ib
London, BM EA 32659
Prov: Umm el-Qaab, Tomb X or Z[113]

Comment: ʿAdj-ib's Horus name is written in front of the *nsw bjt* name Khasty.
Bibliography: Petrie, *RT I*, 19, 38, pl. 5: 11; Spencer, *Objects*, 41 (268), pl. 25: 268.

Doc. 15 three adjoining fragments of a schist bowl
Dyn. 1, prior to the reign of Semer-khet, with inscriptions added naming Semer-khet and Qa-ʿa

[113] Cf. Spencer, *Objects*, 41 (268).

Cairo, Egyptian Museum JE 55268 (one fragment only)
Prov.: Saqqara, Step Pyramid, outside Galleries H and B

Comment: The field in the serekh has been cut down, i.e. the name Semer-khet has been substituted for another.
Bibliography: Gunn, *ASAE* 28 (1928), 158, pl. 1: 5; Lauer, *Pyramide IV.1*, pls. IV: 3, 8: 38; IV.2, 22, (38); Helck, *Thinitenzeit*, 101–102.

Doc. 16 part of a schist bowl
Dyn. 1, reign of ʿAdj-ib, with added inscription of Qa-ʿa
Prov.: Saqqara, Step Pyramid, Great South Court

Comment: The two *nsw bjt nb.tj* names incised on the vessel are Merpi-bia and Qa-ʿa; Iry-netjer was not mentioned.
Bibliography: Lauer, *Pyramide IV.1*, pl. 8: 36; IV.2, 21 (36).

Doc. 17 schist bowl
Dyn. 1, reign of Semer-khet with added inscription of Qa-ʿa
Cairo, Egyptian Museum JE 88344
Prov.: Saqqara, Step Pyramid, Gallery B

Comment: The treatment of the serekhs shows very well that different hands inscribed the two Horus names Semer-khet and Qa-ʿa.
Bibliography: Lauer, *Pyramide IV.1*, pl. 8: 39; IV.2, 22; Kaplony, *Inschriften I*, 593.

Doc. 18 granite statue of a kneeling man
Dyn. 2 or 3
Cairo, Egyptian Museum CG 1
Prov.: Mit Rahineh

Comment: The sign preceding the names Hetep-sekhemwy, Raʿ-neb and Ny-netjer incised in that order on the right shoulder blade of the figure has been interpreted to read divine ancestor (Helck), falcon (Fischer), or phoenix (Moret).
Bibliography: *PM III* (2nd ed.), 864; A. Moret, "L'influence du décor solaire sur la pyramide," in: *Mélanges Maspero* I (Cairo, 1961), 624, fig. 1; Fischer, *Artibus Asiae* 24 (1961), 45–46; E. L. B. Terrace & H. G. Fischer, *Treasures of Egyptian Art from the Cairo Museum* (London, 1970), 25–28; Helck, *Thinitenzeit*, 240.

Doc. 19 diorite bowl
Dyn. 2, reign of Hetep-sekhemwy, with added inscription of Raʿ-neb
Cairo, Egyptian Museum JE 65413
Prov.: Saqqara, Step Pyramid, Gallery H

Comment: The Horus names of Hetep-sekhemwy and Raʿ-neb, incised by different hands, face the goddess Bastet.
Bibliography: Lauer, *Pyramide IV.1*, pls. II: 8, 11: 58; IV.2, 31–32; Fischer, *Artibus Asiae* 24 (1961), 46–47.

Doc. 20 flint bowl
Dyn. 2, reign of Hetep-sekhemwy (or earlier) with inscriptions naming Hetep-sekhemwy and Raʿ-neb
Cairo, Egyptian Museum JE 41981
Prov.: Giza, Valley Temple of Mycerinus

Comment: Both Horus names, incised by different hands, face the goddess Bastet. Hetep-sekhemwy is incised over an erasure, while Raʿ-neb, partially erased, is written behind Hetep-sekhemwy. Reisner argued that Raʿ-neb was succeeded by Hetep-sekhemwy on the basis of the partial erasure of Raʿ-neb's name, but Docs. 21 and 22 show that Raʿ-neb was Hetep-sekhemwy's successor.
Bibliography: G. A. Reisner, *Mycerinus. The Temples of the Third Pyramid at Giza* (Cambridge/Mass., 1931), 102 (1), 179 (1), pl. 70c.; Fischer, *Artibus Asiae* 24 (1961), 46–47; Helck, *Thinitenzeit*, 72, 103.

Doc. 21 footed schist bowl
Dyn. 2, reign of Hetep-sekhemwy or Raʿ-neb, with added inscription of Ny-netjer.
Prov.: Saqqara, Step Pyramid, Gallery B

Comment: The bowl provides evidence for the reign of Ny-netjer being later than that of Hetep-sekhemwy. A reference to the "*ka*-house of Horus Hetep-sekhemwy" follows the name Ny-netjer. As Lacau and Lauer noted, Ny-netjer could have been substituted for the name of another king (Hetep-sekhemwy or Raʿ-neb.)
Bibliography: Lauer, *Pyramide IV.1*, pl. 15: 74; IV.2, 36 (74); Helck, *Thinitenzeit* 195–196.

Doc. 22 fragment from the rim of a bowl of volcanic ash
Dyn. 2, reign of Raʿ-neb, with added inscription of Ny-netjer
London, BM EA 35556
Prov.: Umm el-Qaab, Tomb P

Comment: See Pp. 102–103, above
Bibliography: Petrie, *RT II*, 26, 51, pl. 8: 12; R. Weill, *La IIe et la IIIe dynasties* (Paris, 1908), 150; Spencer, *Objects*, 42 (275), pl. 26: 275; Helck, *Thinitenzeit*, 103, 195–96 (n. 130); Spencer, in: *Kemet* (see n. 75, above), 251.

Doc. 23 fragment of a schist bowl
Dyn. 2, reign of Ny-netjer or slightly later
Cairo, Egyptian Museum JE 55268
Prov. Saqqara, Step Pyramid, outside Galleries H and B

Comment: *nsw bjt* Nub-nefer is mentioned in connection with the building Ḥwt-mn.t-ʿnḫ, also attested from the reign of Ny-netjer.
Bibliography: Lauer, *Pyramide IV.1*, 6, pl. VI: 3; IV.2, 48–49.

Doc. 24 fragment from the rim of a schist bowl
Dyn. 2, reign of Ny-netjer or slightly later
Cairo, Egyptian Museum JE 55294
Prov.: Saqqara, Step Pyramid, outside Galleries H and B

Comment: *nsw bjt* Nub-nefer is mentioned in connection with the building *ḥwt-mn.t-ʿnḫ*; cf. Doc. 23.
Bibliography: Lauer, *Pyramide IV.1*, 6, pl. VI: 3; IV.2, 48–49.

Doc. 25 clay seal impressions
Dyn. 2, reign of Kha-sekhemwy
Oxford, Ashm. Mus. A 1909.1118A-D, F-O; London, UC 112–114 (nos. assigned by Kaplony)
Prov.: Abydos, Shunet ez-Zebib

Comment: The seal (Kaplony, *Inschriften III*, fig. 346) with names of officials, which made these impressions was used in tandem with a seal of Kha-sekhemwy as well as with another naming Netjery-khet; cf. P. 106, above.
Bibliography: Kaplony, *Inschriften I*, 164–66; II, 869 n. 1011; *III*, figs. 269, 346 and 801.

Doc. 26a clay seal impressions
Dyn. 2 or 3, reign of Kha-sekhemwy or Netjery-khet
Cairo, Egyptian Museum CG 11106–112, 11143, 11145; Châteaudun 38(2) (no. assigned by Kaplony); Paris, Louvre no no.; Toronto, ROM B 2324; London, UC 92(2), 95, 96 (nos. assigned by Kaplony); Abydos (cf. Dreyer, infra)
Prov.: Umm el-Qaab; Tomb V

Comment: These impressions from the tomb of Kha-sekhemwy mention Queen Ny-maat-Hep as mother of the royal children.
Bibliography: Kaplony, *Inschriften I*, 161; II, 855 (983), 1137 (325); *III*, fig. 325; Dreyer, *Stationen* (see n. 95 above), 33.

Doc. 26b clay seal impressions
Dyn. 3, reign of Netjery-khet
London, UC 149–52 (nos. assigned by Kaplony)
Prov.: Beit Khallaf, Tomb K1

Comment: These impressions from a tomb dating to the reign of Netjery-khet name Queen Ny-maat-Hep as king's mother. Therefore one can conclude for a sequence Kha-sekhemwy—Netjery-khet.
Bibliography: Kaplony, *Inschriften I*, 167; *II*, 873 (1070), 1137 (326); *III*, fig. 326.

II. 3 THE RELATIVE CHRONOLOGY OF DYNASTY 3

Stephan J. Seidlmayer

To reconstruct the chronology of Dyn. 3,[1] the number, names and sequence of its kings must first be established. Very little information can be gleaned from the Manethonian tradition since the surviving epitomes are unfortunately marred by erratic repetitions and inflated reign lengths.[2] But the kinglists of the NK[3] do provide crucial evidence, while pWestcar preserves the names and sequence of two Dyn. 3 rulers.[4] The data from these sources, summarized in the table below, must be correlated with each other, and with OK evidence:

Westcar	*TC*	Saqqara list	Abydos list	Manetho (Africanus)	Manetho (Eusebius)
	Nb-kꜣ (19 yrs.)		*Nb-kꜣ*	Necherôphês (28 yrs.)	Necherôchis
Ḏsr	*Ḏsrjt (19 yrs.)*	*Ḏsr*	*Ḏsr-zꜣ*	Tosorthros (29 yrs.)	Sesorthos
	Ḏsrtj (6 yrs.)	*Ḏsrttj*	*Ttj*	Tyreis (var. Tyris; 7 yrs.)	six more kings
	Ḥw-ḏfꜣ (6 yrs.)		*Sḏs*	Mesôchris (17 yrs.)	
Nb-kꜣ		*Nb-kꜣ-Rꜥ*	*Nfr-kꜣ-Rꜥ*	Sôyphis (16 yrs.) Tosertasis (19 yrs.)	

(*continued on next page*)

[1] Recent discussions include: Baud, "Ménès"; idem, *Djéser et la IIIe dynastie* (Paris, 2002); Beckerath, *Chronologie*, 160–163; G. Dreyer, "Der erste König der 3. Dynastie", in: *Stationen*, 31–34; S. Seidlmayer, "Die staatliche Anlage der 3. Dynastie", in M. Bietak, ed., *House and palace in Ancient Egypt* (Vienna, 1996), 198–200 note 14.

[2] Waddell, *Manetho*, 40–45. For the relationship between Manetho and the kinglists of the NK, see Helck, *Manetho*, 19–24 and Beckerath, *Chronologie*, 160.

[3] *TC*, col III, lines 4–8; Saqqara list, nos. 12–15; Abydos list, nos. 15–19.

[4] A. M. Blackman, *The Story of King Kheops and the Magicians*, Repr., W. V. Davies, ed., (Reading, 1988), col. I.14, col. I.19 and passim.

Table (*cont.*)

Westcar	*TC*	Saqqara List	Abydos List	Manetho (Africanus)	Manetho (Eusebius)
	Ḥwnj (24 yrs.)	*Ḥwnj*		Achês (42 yrs.)	
				Sêphuris (30 yrs.)	
				Kerpherês (26 yrs.)	
				total: 214 yrs.	total: 198 yrs. (aram: 197 yrs.)

Associating names from the lists with contemporaneous monuments—above all, with royal mortuary complexes—provides additional information about the number and sequence of kings. In OK sources, the names of only two Dyn. 3 kings were written in cartouches: Nebka and Huni. Normally, the kings of the dynasty were identified in contemporaneous sources by their Horus names, not by their personal names. Therefore, the problem of correlating Dyn. 3 attestations with the names of the later lists arises.

Five Horus names are known with certainty from Dyn. 3 contexts: Netjery-khet, Sekhem-khet, Khaʿba, Zanakht and Qahedjet. Two other names were considered by Swelim.[5] Ink inscriptions on some stone vessels from the galleries below the Step Pyramid,[6] i.e., in a Dyn. 2 context,[7] attest the *ka*-house of *za*. Equating *za* with Horus Zanakht and identifying him as Djoser's predecessor and the owner of the original mastaba below the Step Pyramid[8] seems unfounded.[9] *Za* and Zanakht

[5] Swelim, *Problems*, 181–183.

[6] Lacau & Lauer, *Pyramide V*, 7; B. Gunn, "Inscriptions from the Step Pyramid Site", *ASAE* 28 (1928), 168.

[7] W. Helck, "Die Datierung der Gefässaufschriften aus der Djoserpyramide", *ZÄS* 106 (1979), 120–132.

[8] So J.-P. Lauer, *Observations sur les pyramides* (Cairo: BdE 30, 1960), 82; Kaplony, *Inschriften I*, 409; J.-P. Lauer & H. Altenmüller, in: C. Vandersleyen, *Das Alte Ägypten* (Berlin: Propyläen Kunstgeschichte 15, 1975), 113.

[9] Doubts were expressed by: Beckerath, *Handbuch*, 177; Kaplony, *Steingefässe*, 7 n. 8, and Wildung, *Rolle*, 55; Helck rejected these ideas, initially in "Datierung" (n. 7), 130, and subsequently in *Thinitenzeit*, 108.

are clearly different; the common phonetic element *za* is written with a different sign in each name. Since *za* never occurs alone or in a *serekh*, it is doubtful that it represents a king's name.[10] Reports on an alleged Horus Bꜣ, mentioned by Swelim, cannot be verified; even if he could be shown to exist, there are no grounds for assigning him to Dyn. 3.

Reviewing the available documentation, a number of problems are evident which are taken up in turn below. Both *TC* and the Abydos List name Nebka as the first ruler of the dynasty. But in pWestcar, a king Nebka is a successor of Djoser, while a basically similar name occurs in the Saqqara List as the penultimate entry and as the last in the Abydos List. It was always suspected that there was only a single king Nebka whose name was duplicated (in the Abydos List) or shifted from its correct position. Since all attestations for Nebka from the OK can be shown to refer to a king who reigned near the end of Dyn. 3, the existence of a like-named king at the beginning of the dynasty was always doubtful. Recent excavations at Abydos revealed unequivocal evidence that Horus Netjery-khet buried Khaʿ-sekhemwy, the last king of Dyn. 2,[11] there, making it certain that no reign (and especially, a chronologically significant one as shown in *TC*) could have intervened between them.

Djoser, the second name in the list and, in fact, the first king of Dyn. 3, is well attested. Later inscriptions confirm his identity with Horus Netjery-khet, the owner of the Step Pyramid complex at Saqqara.[12] His successor Djoserti/Djoser-teti is certainly Horus Sekhem-khet, the owner of the second, smaller step pyramid complex at Saqqara. Evidence for the equation includes the morphological similarity of the two architectural complexes, their geographic proximity and the fact that the Nebti-Name of Sekhem-khet is attested as Djosert(i)-ʿankh on an ivory plaque from his pyramid.[13]

Data for the three remaining kings are less easily brought into line. The so-called Layer Pyramid of Zawyet el-Aryan is the only other pyra-

[10] See J.-P. Lauer, "A propos de l'invention de la pierre de taille", in: *Fs G. Mokhtar* (Cairo: BdE 97.2, 1985), 62–63.

[11] Dreyer, in: *Stationen*, 31–33.

[12] The relevant sources are the Famine stela at Sehel, temp. Ptolemy V (P. Barguet, *La stèle de la famine à Séhel*, Cairo: BdE 24, 1953), a statue dedicated by Ahmose (Berlin 14765; Wildung, *Rolle*, 79–83) and numerous graffiti left by NK visitors to the Step Pyramid complex (Wildung, *Rolle*, 65–72).

[13] M. Baud, *Djéser* (n. 1), 67–68. Doubts expressed by Helck, "Das Kleidertäfelchen aus der Pyramide des *Sḫm-ḫt*", *WZKM* 54 (1957), 72–76, do not seem justified.

mid complex datable to Dyn. 3.[14] The "great excavation" at the same site is not contemporaneous with the Layer Pyramid, but belongs instead to later Dyn. 4.[15] The brickwork-complex of el-Dêr, discussed by Swelim,[16] is probably not a pyramid at all (although it is difficult to judge this monument on the basis of available documentation).[17] If it were a pyramid, its comparatively small size would associate it with the series of small step pyramids in UE. Finally, evidence currently available supports the assignment of the initial building phase of the pyramid at Maidum to Snofru (and Dyn. 4), not to Huni.[18]

Architecturally, the Layer Pyramid of Zawyet el-Aryan is very close to the step pyramids at Saqqara—for example, the extensive subterranean magazines are a common feature—and quite different from the earlier phase of the Maidum pyramid. Accordingly, the structure is most likely assignable to the successor of Horus Sekhem-khet/Djoserti; in any case, it should not belong to Huni. The archaeological record preserves no evidence of mortuary complexes for two later Dyn. 3 kings, a fact which may not be due simply to accident of preservation. Their absence may reflect instead a temporary restructuring of arrangements for the royal mortuary cult related to the appearance at the end of the dynasty of the series of small step pyramids in UE associated with the names of kings Nebka, Huni and Snofru.[19] This line of reasoning supports an early date for the Layer Pyramid.

The name of the Layer Pyramid's owner, Djoser's second successor, is listed as missing (*Sḏs, Ḥw-ḏfꜣ*) in *TC*. Several stone vessels from

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[14] *PM* III, 313.

[15] Convincingly established by J.-P. Lauer, "Sur l'âge et l'attribution de l'excavation monumentale à Zaouiêt el-Aryân", *RdÉ* 14 (1962), 21–36. Thus the much-discussed royal name which appears in the masons' graffiti from this monument (e.g. J. Cerny, "Name of the King of the Unfinished Pyramid at Zawjet el-Aryan", *MDAIK* 16 (1958), 25–29, and A. M. Dodson, "King [*Bjk-kꜣ*]", *ZÄS* 108 (1981), 171) is irrelevant for the history and chronology of Dyn. 3.

[16] Swelim, *Problems*, 337.

[17] Cf. the archaeological situation as presented in the original publication, M.R. Macramallah, "Une forteresse du moyen empire (?) à Abou Rawâch", *ASAE* 32 (1932), 161–173. Macramallah's opinion on the dating of the site is very tentative.

[18] See R. Stadelmann, "Snofru und die Pyramiden von Maidum und Dahschur", *MDAIK* 36 (1980), 443–446.

[19] W. Kaiser & G. Dreyer, "Zu den kleinen Stufenpyramiden Ober- und Mittelägyptens", *MDAIK* 36 (1980), 43–59; Seidlmayer, in "Anlage" (n. 1), 205–209; idem, "Town and State in the Early OK, a view from Elephantine", in *Aspects of Early Egypt*, A. J. Spencer, ed., (London, 1996), 108–127. Horus Zanakht/Nebka is represented by a seal impression in the context of the royal complex attached to the pyramid at Elephantine and the name Huni occurs in an inscription on a block from the pyramid; for Snofru as the owner of the pyramid of Seila see J. Leclant, *Orientalia* 57 (1988), 336 Fig. 40, and *Orientalia* 58 (1989), 368.

mastaba Z500 in the cemetery of Zawyet el-Aryan[20] bear the Horus name Khaʿba who might well be the owner of the pyramid. But, theoretically, Khaʿba could also be a successor of the Layer Pyramid's owner. As the next ruler, the NK lists name Nebka-Reʿ or Nefer-ka-Reʿ, both corrupted from Nebka, the name attested in pWestcar and twice in the OK. The earlier OK attestation occurs in inscriptions from the mastaba of Akhetʿa who held a priestly title in the king's cult.[21] Helck identified Akhetʿa with a person whose titles (but neither the title relating to the cult of Nebka nor the name) appear among the inscriptions on stone vessels from the Step Pyramid, to conclude that both the person and King Nebka date to early Dyn. 3.[22] But this equation is neither obvious nor convincing. Even if Helck were correct, Akhetʿa could have nevertheless outlived Djoser and his immediate successors to serve in the cult of a later king Nebka. The style of the reliefs from Akhetʿa's tomb and the overall similarity of its plan to the tomb chapel of Metjen clearly point to a late Dyn. 3/early Dyn. 4 date for the owner. The fact that the king's name in Akhetʿa's title is written in a cartouche clearly precludes the possibility that the tomb could have been decorated under Djoser.

The second OK attestation of King Nebka occurs in the name of a funerary domain associated with the cult of Neusserreʿ.[23] The context links Nebka to late Dyn. 3/early Dyn. 4 when the system of funerary domains is first attested, under Huni and Snofru.[24] Thus the pre-NK sources substantiate the presence of a king Nebka towards the end of Dyn. 3, a conclusion quite in keeping with the fact that the existence of a like-named ruler at the very beginning of Dyn. 3 can be excluded.

Significantly, Nebka can be identified with Horus Zanakht on the basis of a seal impression from mastaba K2 at Beit Khallaf where the names occur in parallel.[25] The king is attested as Horus Zanakht at a

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[20] For the inscriptions see D. Dunham, *Zawjet el-Aryan. The Cemeteries of the Layer Pyramid*, (Boston, 1978), 29–34, pl. XIIA. G. A. Reisner, *Mycerinus, The Temples of the Third Pyramid at Giza*, (Cambridge Mass., 1931), 103, classifies Z500 as a stairway mastaba, making Swelim's idea (Problems, 78–89) that it could be the mortuary temple of the Layer Pyramid unlikely.

[21] Ziegler, *Catalogue*, 96–103.

[22] W. Helck, "Datierung" (n. 7), 129; idem, *Thinitenzeit*, 107.

[23] Borchardt, *Ne-user-Re*, 79 Fig. 54.

[24] H. K. Jacquet-Gordon, *Les noms des domaines funéraires sous l'Ancien Empire Égyptien* (Cairo: BdE 34, 1962), 7–10.

[25] Seidlmayer, in "Town" (n. 19), 121, and Pl. 23.

number of other sites, in the rock inscriptions of Wadi Maghara, and by seal impressions from the mortuary temple of the Step Pyramid and from Elephantine.[26] One sealing from Elephantine derives from layers of refuse in the royal complex attached to the small step pyramid at the site establishing a connection between Nebka and the series of small step pyramids in UE. Unfortunately, the stratigraphic position of the sealing is too equivocal to allow the relationship to be defined more precisely.[27]

As the last ruler of Dyn. 3, the *TC* and the Saqqara List cite Huni, a corrupted form of *nswt Ḥwj*.[28] Huni was apparently the first king regularly identified in contemporaneous sources by his personal name, prefaced *nswt* (by contrast to the later usage of *nswt-bjt*), written in a cartouche. To date, no document gives Huni's Horus name in association with his personal name. There is, however, one monument which needs to be discussed in this context: a relief slab of Horus Qahedjet depicting him embraced by Horus of Heliopolis.[29] Allegedly from Dahshur, it should derive from a Dyn. 3 royal mortuary complex at the site. In fact, two alabaster sarcophagi from a shaft tomb in the vicinity of the mortuary precinct of Senwosret III provide evidence for the presence of a Dyn. 3 royal complex at Dahshur.[30] Accordingly, Qahedjet is an ideal candidate for Huni's Horus name. It should not be overlooked, however, that the correlation is not absolutely certain. If Khaʿba is not the name of the owner of the Layer Pyramid at Zawyet el-Aryan, but rather of one of his successors, then Khaʿba could qualify as Huni's Horus name. (Because of its early architectural type, it is

[26] Discussed by Seidlmayer, in W. Kaiser et al., "Stadt und Tempel von Elephantine, 9./10. Grabungsbericht", *MDAIK* 38 (1982), 304 with n. 82.

[27] Ibidem, 304–305, idem, in "Anlage" (n. 1), 198–200.

[28] This reading was established by L. Borchardt, "König Huni?", *ZÄS* 46 (1909), 12–13, and corroborated by H. Schäfer, "König Huni", *ZÄS* 52 (1914), 98–100. The discussion triggered by H. Goedicke's article "The Pharaoh *Ny-swtḥ*", *ZÄS* 81 (1956), 18–24, and continued by E. Meltzer, "A reconsideration of [*njswt Ḥwj*]", *JEA* 57 (1971), 202–203, W. Barta, "Zum altägyptischen Namen des Königs Aches", *MDAIK* 29 (1973), 1–4, and W. Helck, "Der Name des letzten Königs der 3. Dyn. und die Stadt Ehnas", *SAK* 4 (1976), 125–134, remains unconvincing. Why should not the first king who regularly had his personal name inscribed in a cartouche include the title *nswt* inside the ring, in contrast to what became convention only subsequently? Actually this would parallel the usage attested much more frequently with the epithet zꜣ-Rʿ which was sometimes included within the cartouche.

[29] J. Vandier, "Une stèle égyptienne portant un nouveau nom royal de la troisième dynastie", *CRAIBL* (1968), 16–22; Ziegler, *Catalogue*, 54–57.

[30] *PM* III, 885. I am grateful to Dieter Arnold for pointing this out to me.

unlikely that the pyramid is Huni's tomb). If so, the name Qahedjet could be the Horus name of Djoser's second successor whose personal name is lost from the NK lists. Since Qahedjet probably owned a mortuary complex at Dahshur, the Layer Pyramid would necessarily belong to Horus Zanakht/Nebka. This reconstruction is not in itself impossible, but it seems to suit the available evidence less well. The results of these deliberations may be summarized as follows:

Name in cartouche	Horus name	Mortuary complex
Ḏsr	*Nṯrj-ẖ.t*	great step pyramid, Saqqara
Ḏsrtj	*Sḫm-ẖ.t*	lesser step pyramid, Saqqara
(unknown)	*Ḫꜥ-bꜣ*	layer pyramid, Zawyet el-Aryan
Nb-kꜣ	*Zꜣ-nḫt*	(unknown)
nswt Ḥwj	*Qꜣ-ḥḏ.t*	mortuary cult place of unknown type at Dahshur

Data currently available are sufficient neither for determining the length of reigns for each king nor the length of the dynasty as a whole. Nor does contemporaneous evidence exist for estimating a minimum length of reign for any king. Only *TC* provides more or less useful data. However, King Nebka was displaced in this document to the beginning of the dynasty; perhaps the 19-year reign accorded him does not represent original information but simply duplicates the figure given for Djoser. The lengths of reigns in the Manethonian tradition are arbitrarily inflated; it would be guesswork to attempt to reduce them just as arbitrarily.

The Old Kingdom Annals unfortunately can provide little assistance.[31] The Palermo fragment preserves the end of Khaʿ-sekhemwy's reign and the beginning of Djoser's in line 5. In addition, Kaiser noticed that, taking all the available criteria into account, the distance between Cairo 1 and the Palermo fragment can be reconstructed so that the distance between the two changes of reign preserved on both fragments matches the combined reign lengths of Djoser and Djoserti as recorded in the *TC*.[32] While the line separating the two reigns is not actually visible on

[31] See Beckerath, *Chronologie*, 174–179; Baud, "Ménès", 135–138; idem, Djéser (n. 1), 50–52; Wilkinson, *Annals*.

[32] W. Kaiser, ZÄS 86 (1991), 44 with note 8.

the stone,[33] such a reconstruction would still seem possible, in view of the worn state of the surface at this place. Therefore, the evidence of the Annals at least does not necessarily contradict the testimony of the *TC*.

Any reconstruction of the lengths of the reigns for later Dyn. 3 rulers depends on estimating the distance between Cairo fragment 1 and the left edge of the original stone slab. Beckerath's recent calculation allows only 24 years for all three remaining kings, in clear contradiction of *TC* which gives 24 years to Huni alone plus six more for "Hu-djefa". In addition, an unknown number of years has to be taken into account for Nebka. In view of the extremely fragmentary state of the evidence, it would be hasardous to put excessive trust into any attempt to reconstruct the original slab. Given the current state of knowledge, it is wiser to regard the total of 50 years for the entire dynasty, which emerges from Beckerath's reconstruction, only as a minum figure. However, even if the 19 years for Nebka of the *TC* be considered reliable, the total length of the dynasty would not exceed 75 years.

[33] Wilkinson, *Annals*, 53.

II. 4 CONTEMPORANEOUS EVIDENCE FOR THE RELATIVE CHRONOLOGY OF DYNS. 4 AND 5

Miroslav Verner

The crucial problem for reconstructing the relative chronology of Dyns. 4 and 5 is our ignorance of how the system of dating according to the "year/occasion of the (cattle) count" (*rnpt zp*) was employed. Ever since Gardiner's paper,[1] specialists have acknowledged that this census formed the basis for counting regnal years during the OK. The existence and use of the term *rnpt m-ḫt zp* ("year after the count") was taken as clear-cut evidence for a biennial census. However, the preponderance of *rnpt zp* over *rnpt m-ḫt zp* years among the burgeoning number of dates recovered in recent years from excavations, taken in conjunction with an entry on the Palermo Stone attesting the cattle count in two successive years of Snofru, indicates that the situation is much more complex. Nowadays, some Egyptologists maintain that the census was biennial during Snofru's reign with the sole exception of the seventh and eighth counts which were conducted in successive years.[2] Others are of the opinion that a biennial system was not employed under Snofru,[3] while yet others equivocate.[4] For subsequent reigns, opinions fluctuate from the presumption of a biennial system[5] to the assumption that on certain occasions an "odd" count could have been ignored.[6] Finally, there is also the theory that annual cattle counts became more and more frequent during the OK until they became the rule by the end of Dyn. 6.[7]

Obviously the existence of the census per se is not at issue, but rather its regularity during the OK. However, a statistical review of documented

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[1] Gardiner, "Years", 11–28.

[2] E.g. R. Stadelmann, "Beiträge zur Geschichte des Alten Reiches", *MDAIK* 43 (1987), 229–239; Baud, "Ménès", 121.

[3] E.g. R. Krauss, "Pyramid", 47–50.

[4] E.g. Spalinger, "Texts", 281.

[5] E.g. Baud, "Ménès", 122–123, 128–129.

[6] Spalinger, "Texts", 318.

[7] Beckerath, *Chronologie*, 147.

dates, even if the list is incomplete and the attribution of some contested, allows some conclusions. For example, from the beginning of Dyn. 4 to the end of Dyn. 5, the years of the count and those following the count occurred in succession, and *rnpt zp* years were consistently more frequently documented than *rnpt m-ḫt zp* years. Moreover, no clear-cut tendency can be observed towards a marked decrease in the number of years following the count throughout the period.[8] On the contrary, the evidence for *rnpt zp* and rnpt *m-ḫt zp* from Snofru's reign at the beginning of Dyn. 4 to Djedkareʿ's at the end of Dyn. 5 supports the opposite conclusion.

Could a cattle count take place in the year of a king's accession to the throne? Until quite recently, the opinion prevailed that the first cattle count of any given king's reign occurred during the first full year after his accession. But an entry among the annals inscribed on the stone recently discovered at South Saqqara casts doubt on this assumption, since the text explicitely mentions a (cattle) count of the year of the "Unification of the Two Lands" at the beginning of the reign of Merenreʿ.[9]

The potential usefulness of the series, though incomplete, of *rnpt zp* and *rnpt m-ḫt zp* dates for Dyns. 4 and 5 is demonstrated by analysis of the data for both Snofru and Djedkareʿ. Down to the present, the highest recorded number of *rnpt zp* years for Snofru is 24; only half of them (viz., *rnpt zp* 2, 7, 8, 12, 13, 14, 15, 16, 18, 23 and 24) are documented among the preserved dates. Can we assume that about the same proportion—i.e., ca. half of the evidence for the intervening *rnpt m-ḫt zp* years—remains to date unattested? If so, the number (three) of such currently documented dates—*rnpt m-ḫt zp* 10, 13 and 18—should be doubled. An estimate for the length of Snofru's reign based on these data would be 24 + 6 = 30 years. Using other arguments, Krauss[10] and, independently, Barta[11] arrived at nearly the same length for the king's reign.

Djedkareʿs highest documented census is the 21st (or possibly the 22nd). Thirteen other "occasions" are known: 1, 3, 4(?), 5, 6, 8, 9, 10, 11, 14, 15, 16, 17, and 18. In this series, seven (and possibly eight)

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[8] Contra Beckerath, *Chronologie.*

[9] Baud & Dobrev, "Annales", 47.

[10] R. Krauss, "The Length of Sneferu's reign and how long it took to build the Red Pyramid", *JEA* 82 (1996), 48.

[11] W. Barta, "Die Chronologie der 1. bis 5. Dynastie nach den Angaben des rekonstruierten Annalensteins", *ZÄS* 108 (1981), 21.

rnpt zp or about one-third of the total is still unattested. There are seven *rnpt m-ḫt zp* dates preserved: 1, 3, 4, 7(?), 10, 14, and 17. Adding a third of this amount, or about two years, to the number of *rnpt zp* (21 or 22?) and *rnpt m-ḫt zp* (7) years actually attested yields 30 (or possibly 31) years for the reign. It must be emphasized, however, that for the present these calculations, since speculative, must be treated with reserve.

No matter how cautiously conclusions be drawn, the available data indicate that the dating system was irregular during Dyns. 4 and 5, and not principally biennial with few exceptions. In practice, annual cattle counts apparently prevailed. The theory that intervening years were omitted from the record under certain circumstances[12] is contradicted by the so-called masons' inscriptions which consistently refer only to *rnpt zp* years. These short texts associated with the construction projects of the state are the most frequently preserved dated documents from Dyn. 4 and 5. Why should these inscriptions regularly omit every second year from the administrative record?

If an irregular dating system pertained during Dyns. 4 and 5, what economic and/or administrative necessity determined its irregularity? It is possible, for instance, that during the formative period of the bureaucracy the frequency of the census was linked to the financing of large projects—buildings, reclamation of land from the marshes, etc. Were consecutive census years occasioned by funding shortfalls? Were factors influencing the decision to organize the census annually or biennally always the same or did they differ?

A special problem is the discrepancy between the available contemporaneous evidence and the reign lengths recorded of Dyns. 4 and 5 rulers in the *TC*. By contrast to the Manethonian tradition, the *TC* was long considered by specialists to be the standard against which contemporaneous data should be measured. Reign lengths given in the papyrus were sometimes used as evidence for annual cattle counts and at other times, for a biennial census. The compiler was presumed to have omitted one or more signs from some figures and to have mistakenly duplicated entries. Obviously, comparison of data from the very damaged papyrus with contemporaneous evidence can hardly be expected to provide a definitive version of OK chronology. The names of only three Dyn. 4 and 5 kings survive in the papyrus out of a presumed 17; three more partially-preserved names can be reconstructed. The

[12] Posener-Kriéger, "Graffiti"; see also Spalinger, "Texts", 318.

remaining eleven are lost. Furthermore, the sequences at the end of Dyn. 4 and in mid-Dyn. 5 are by no means certain. Nor does evidence from contemporaneous documents always inspire confidence. For example, there is only a single case where the precise date of a king's death and the accession of his successor are known, viz. for Sahureʿ followed by Neferirkareʿ. Regardless, the exact length of Sahureʿ's tenure still cannot be established, since we do not know how regularly the census was taken during his reign.

Disappointing as this may be, analysis of contemporaneous dates, both *rnpt zp* and *rnpt m-ḫt zp*, offers some stimulating insights. Assuming that the census was irregular throughout Dyns. 4 and 5, the minimum length of a given king's reign should equal the total of the highest attested census year (*rnpt zp*) and the number of attested intervening years (*rnpt m-ḫt zp*). A comparison of the results of such calculations with the data recorded in the *TC* is represented in the table that follows:

	Contemporaneous Evidence	*TC*
Dyn. 4		
Snofru	27 + x years	24 years
Cheops (Khufu	13 + x	23
Raʿdjedef	11 (10?) + x	8
Khephren (Raʿkhaʿef)	15 + x	?
Bicheris	not attested	?
Mycerinus (Menkaureʿ)	14 (?) + x	18
Shepseskaf	2 + x	4
Thamphthis	not attested	2
Dyn. 5		
Userkaf	4 + x	7
Sahureʿ	8 + x	12
Neferirkareʿ	5 + x	?
Shepseskareʿ	not attested	7
Raʿneferef	1 + x	1
Neuserreʿ	8(?) + x	11 + x
Menkauhor	not attested	8
Djedkareʿ	28 (29 ?) + x	28
Wenis	9 + x	30

As can be seen, the estimate for the length of Snofru's reign exceeds the figure provided by the papyrus; the same is probably true for the reigns of Raʿdjedef and Djedkareʿ. On the other hand, the entry in

the *TC* for Shepseskareʿ, if correctly associated with that king, does not reflect the contemporaneous record, since virtually no clear-cut evidence for this mysterious ruler has yet surfaced.[13] Such discrepancies call into question the credibility of the papyrus for Dyns. 4 and 5.[14]

List of Contemporaneously Documented Dates, Dyns. 4–5

SNOFRU
TC III.9: 24 years
Manetho: Sóris—29 years
Beckerath, *Chronologie*, 159: 35 years (?)

rnpt zp
- 2 *(n) ṯnwt*; Cairo frg no. 4[15]
- 7 *(n) ṯnwt*; Palermo Stone, recto 6[16]
- 7, *ꜣbd III;* Maidum pyramid[17]
- 8 (18 ?), *ꜣbd III šmw, sw 2*; Maidum pyramid[18]
- 8 *(n) ṯnwt*; Palermo Stone, recto 7[19]
- 12, *ꜣbd IV šmw, sw 1* (?); Maidum pyramid[20]
- 13, . . . *prt* (?), *sw 10*; Maidum pyramid[21]
- 13 (16 ?), *ꜣbd I šmw, sw* . . .; Maidum pyramid[22]
- 13, . . . *šmw, sw* . . .; Maidum pyramid[23]
- 13 (16 ?), . . . *šmw, sw* . . .; Maidum pyramid[24]
- 13; Maidum pyramid[25]

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[13] M. Verner, "Who was Shepseskare, and when did he reign?", in: M. Bárta, J. Krejčí, eds., *Abusir and Saqqara in the year 2000* (Prague, 2000), 581–602.
[14] Verner, "Remarks".
[15] H. Gauthier, "Quatre nouveaux fragments de la pierre de Palerme", in: G. Maspero, *Le Musée égyptien* III (Cairo, 1915), 50–52.
[16] Schäfer, "Annalen", 30.
[17] Posener-Kriéger, "Graffiti", 20, pl. 8, A.20.
[18] Posener-Kriéger, "Graffiti", pl. 8, A.27.
[19] Schäfer, "Annalen", 31.
[20] Posener-Kriéger, "Graffiti", pl. 8, A.33.
[21] Posener-Kriéger, "Graffiti", pl. 7, A.1.
[22] Posener-Kriéger, "Graffiti", pl. 7, A.11.
[23] Posener-Kriéger, "Graffiti", pl. 7, A.5.
[24] Posener-Kriéger, "Graffiti", pl. 7, A.9.
[25] Posener-Kriéger, "Graffiti", pl. 7, A.2.

- 13; Maidum pyramid[26]
- 14 (17 ?), *ꜣbd II šmw, sw* . . .; Maidum pyramid[27]
- 14 (17 ?), . . . *prt*; Maidum pyramid[28]
- 14 (17 ?), *ꜣbd I + x*; Maidum pyramid[29]
- 15, *ꜣbd II prt, sw 14*; Dahshur, Red Pyramid[30]
- 15 (?), *ꜣbd III prt*; Maidum pyramid[31]
- 15, *ꜣbd III šmw, sw 10 + x*; Maidum pyramid[32]
- 15 (?), *ꜣbd IV šmw* (?), *sw 10*; Maidum pyramid[33]
- 15 (?), . . . *šmw* (?), *sw* . . .; Maidum pyramid[34]
- 15; Dahshur, Red Pyramid[35]
- 16, *ꜣbd I ꜣḫt, sw 13*; Dahshur, quarry mark[36]
- 16, *ꜣbd III ꜣḫt*; Dahshur, Red Pyramid[37]
- 16, *ꜣbd IV ꜣḫt, sw 14*; Maidum pyramid[38]
- 16, *ꜣbd II* (?) *šmw, sw 12*; Maidum pyramid[39]
- 16 (?), *ꜣbd* . . . *prt, sw 2*; Dahshur, Red Pyramid[40]
- 16 (?), *ꜣbd I prt*; Maidum pyramid[41]
- 16 (?), *ꜣbd III prt*; Maidum pyramid[42]
- 16; Maidum pyramid[43]
- 17, *ꜣbd II prt, sw 10 + x*; Maidum pyramid[44]
- 17, *ꜣbd I prt, sw 20*; Maidum pyramid[45]

[26] Posener-Kriéger, "Graffiti", pl. 8, A.31.
[27] Posener-Kriéger, "Graffiti", pl. 8, A.23.
[28] Posener-Kriéger, "Graffiti", pl. 8, A.24.
[29] Posener-Kriéger, "Graffiti", pl. 8, A.26.
[30] R. Stadelmann (n. 2), 234–235, fig. 2.
[31] Posener-Kriéger, "Graffiti", pl. 7, A.4.
[32] W. M. F. Petrie, E. J. H. Mackay & G. A. Wainwright, *Meydum and Memphis* III (London, 1910), 9, pl. V, 6.
[33] Posener-Kriéger, "Graffiti", pl. 7, A.6.
[34] Posener-Kriéger, "Graffiti", pl. 7, A.9.
[35] Stadelmann (n. 2), 233–5, fig. 1.
[36] *LD* II, I g.
[37] Stadelman (n. 2), 234–235, fig. 2.
[38] A. Rowe, *The Museum Journal* 22 (1931), 26, pl. 38, fig. 2.
[39] Posener-Kriéger, "Graffiti", pl. 7, A.3.
[40] H. Sourouzian, *MDAIK* 38 (1982), 389–390, fig. 5.
[41] Rowe (n. 38), 26.
[42] Posener-Kriéger, "Graffiti", pl. 8, A.22.
[43] Posener-Kriéger, "Graffiti", pl. 7, A.7.
[44] Petrie et al. (n. 32), 9, pl. 5, 2 left.
[45] Posener-Kriéger, "Graffiti", pl. 7, A.13.

- 17, *ꜣbd I prt, sw 22*; Maidum pyramid[46]
- 17, *ꜣbd III prt, sw ꜥrq*; Maidum pyramid[47]
- 17, *ꜣbd III prt, sw* . . .; Maidum pyramid[48]
- 17, *ꜣbd III ꜣḫt,* . . .; Maidum pyramid[49]
- 17, . . . *prt*; Maidum pyramid[50]
- 17, *(ꜣbd) I + x prt*; Maidum pyramid[51]
- 17, *(ꜣbd) I + x*; Maidum pyramid[52]
- 17, *ꜣbd* . . .; Maidum pyramid[53]
- 17; Maidum pyramid[54]
- 18, *ꜣbd I prt, sw 21*; Maidum pyramid[55]
- 23, *ꜣbd II šmw*; Maidum pyramid[56]
- 24, *ꜣbd II ꜣḫt,* . . . (?); Dahshur, Red Pyramid[57]
- 24, *ꜣbd* . . . *prt,* . . .; Dahshur, Red Pyramid[58]

Damaged evidence of *rnpt zp*

- 10 + x, *ꜣbd IV šmw*; Maidum pyramid[59]
- 10 + x; Maidum pyramid[60]
- (1)6 (?), *ꜣbd I + x, sw 12*; Maidum pyramid[61]
- (1)6 (?), *ꜣbd I + x, šmw* (?), s*w 2*; Maidum pyramid[62]
- (1)7 (?), *IV šmw, sw 21*; Maidum pyramid[63]
- . . ., *ꜣbd IV* . . ., *sw* . . .; Maidum pyramid[64]

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[46] Posener-Kriéger, "Graffiti", pl. 7, A.14.
[47] Petrie et al. (n. 32), 9, pl. 5,4.
[48] Petrie et al. (n. 32), 9, pl. 5, 3.
[49] Posener-Kriéger, "Graffiti", pl. 7, A.12.
[50] Posener-Kriéger, "Graffiti", pl. 7, A.16.
[51] Posener-Kriéger, "Graffiti", pl. 7, A.17.
[52] Posener-Kriéger, "Graffiti", pl. 7, A.18.
[53] Posener-Kriéger, "Graffiti", pl. 8, A.21.
[54] Posener-Kriéger, "Graffiti", pl. 7, A.19.
[55] Posener-Kriéger, "Graffiti", pl. 8, A.29.
[56] Posener-Kriéger, "Graffiti", pl. 9, A.42.
[57] Reconstruction of a mason's mark in *LD Text* I, 206 by Stadelmann (n. 2), 234–236, fig. 3.
[58] Stadelmann (n. 2), 239–240, fig. 4.
[59] Posener-Kriéger, "Graffiti", pl. 8, A.34.
[60] Posener-Kriéger, "Graffiti", pl. 8, A.35.
[61] Posener-Kriéger, "Graffiti", pl. 7, A.8.
[62] Posener-Kriéger, "Graffiti", pl. 7, A.10.
[63] Posener-Kriéger, "Graffiti", pl. 7, A.15.
[64] Posener-Kriéger, "Graffiti", pl. 9, A.36.

- . . ., *ꜣbd III šmw, sw* . . .; Maidum pyramid[65]
- . . ., *ꜣbd III šmw, . . . 10 + x*; Maidum pyramid[66]

rnpt (m)- xt zp[67]
- 10, *ꜣbd 1 + x*; Maidum pyramid[68]
- 13, . . .; Maidum pyramid[69]
- 18, *ꜣbd IV šmw, sw* (?) *5*; Maidum pyramid[70]

damaged evidence of *rnpt (m-)ḫt zp*
- . . .; Maidum pyramid[71]

attested *rnpt zp*: 2; 7; 8; 12; 13; 14; 15; 16; 17; 18; 23; 24
attested *rnpt (m-)ḫt zp*: 10; 13; 18
rnpt zp: rnpt (m-)ḫt zp—12: 3

CHEOPS (KHUFU)
TC III.10 (?): 23 years
Manetho: Súphis (I)—63 years
Beckerath, *Chronologie*, 159: 23 years

rnpt zp
- 4 (?), *ꜣbd* . . .; G 2130, Khentika[72]
- 5, . . . *šmw* (?), *sw 5*; G 1203[73]
- 8, *ꜣbd I prt*, . . . (?); a loose (?) block found at the upper end of the causeway, near the entrance to the king's mortuary temple[74]
- 8, *ꜣbd III šmw, sw 20*; G 4000, Hemiunu[75]
- 10, *ꜣbd IV prt, sw 23* (or *24*); G 4000, Hemiunu[76]

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[65] Posener-Kriéger, "Graffiti", pl. 9, A.37.
[66] Posener-Kriéger, "Graffiti", pl. 9, A.41.
[67] For the transcription of *m-ḫt* see Edel, *Grammatik*, 180.
[68] Posener-Kriéger, "Graffiti", pl. 8, A.30.
[69] Posener-Kriéger, "Graffiti", pl. 8, A.32.
[70] Posener-Kriéger, "Graffiti", pl. 8, A.28.
[71] Posener-Kriéger, "Graffiti", pl. 9, A.38.
[72] Attributed to Khufu by Smith, "Evidence", 118 fig. 6; 127 no. 4; so also Y. Harpur, *Decoration in Egyptian Tombs of the Old Kingdom* (London, 1987), 269.
[73] Attributed to Khufu by Smith, "Evidence", 118, fig. 6; 127 no. 2, and by G. A. Reisner, *A History of the Giza Necropolis* I (Cambridge, Mass., 1942), 76 n. 2 and 391/19/.
[74] Attributed to Khufu by Smith, "Evidence", 119 fig. 7; 126f. no. 1; originally, A. Rowe read this date "year 13", see Reisner (n. 73), 71.
[75] Attributed to Khufu by Junker, *Giza I*, 159, fig. 24/10/, 161.
[76] Junker, *Giza* I, 161, no. 12.

- 10, *ꜣbd I šmw, sw 10 + x*; G 4000, Hemiunu[77]
- 10, *ꜣbd II šmw, sw 10 + x*; G 4000, Hemiunu[78]
- 12, *ꜣbd II šmw*; G 2120, Seshatsekhentiu[79]
- 12, *ꜣbd II*...; G 7130–40, Khufukhaf I[80]

rnpt (m-)ḫt zp
- 13[81]

attested *rnpt zp*: 4, 5, 8, 10, 12
rnpt (m-)ḫt zp: 13
rnpt zp: rnpt (m-)ḫt zp—5: 1

RAʿDJEDEF
TC III.11 (?): 8 years
Beckerath, *Chronologie*, 159: 9 years

rnpt zp
- 1, *ꜣbd III prt*, ...; pyramid of Raʿdjedef[82]
- 11 (or 10 ?), *ꜣbd I pr(t), sw 24* (?); boat pit, south side of Khepos's pyramid[83]

attested *rnpt zp*: 1, 11 (10 ?)
rnpt (m-)ḫt zp: not attested
rnpt zp: rnpt (m-)ḫt zp: 2: 0 (?)

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[77] Junker, *Giza* I, 158, 160; 159 fig. 24/1/.

[78] Junker, *Giza* I, 159 fig. 24/2/; 160.

[79] Attributed to Khufu by Smith, "Evidence", 118, fig. 6; 127 no. 3, and by Spalinger, "Texts", 285; according to N. Strudwick, *The Administration of Egypt in the Old Kingdom* (London, 1985), 117 no. 6, the reign of Khephren is also possible.

[80] Attributed to Khufu by Smith, "Evidence", 119, fig. 7; 127 no. 8, and by W. K. Simpson, *The Mastabas of Kawab, Khafkhufu I and II* (Boston, 1978), 9. This dating also accords with Stadelmann's theory that Khufukhaf I assumed the name Khephren after succeeding Raʿdjedef, see *SAK* 11 (1985), 165–172.

[81] K. P. Kuhlmann, in: *Tides of the Desert—Gezeiten der Wüste. Contributions to the Archaeology and Environmental History of Africa in Honmour of Rudolph Kuper* (Köln: *Africa Praehistorica* 14, 2002), 125–138.

[82] M. Vallogia, in: *Études sur l'Ancien Empire et la nécropole de Saqqara dédiés à Jean-Philippe Lauer* (Montpellier, 1997), 419.

[83] According to I. E. S. Edwards, in: *The Unbroken Reed: Studies in the Culture and Heritage of Ancient Egypt in honour of A. F. Shore* (London, 1994), 101, 105 n. 20, Posener-Kriéger read "year 10" (i.e. "year of the 10th cattle count"); see also R. Krauss, *Orientalia* 66 (1997), 3 n. 16. Both readings are possible; however, the reading of the left column with the date is not doubt-free, and the right column of the graffito is almost illegible, see A. M. Abubakr & A. Y. Mustafa, *The Funerary Boat of Khufu*, in: *BÄBA* 12 (1971), 11, fig. 6 bottom left.

KHEPHREN (RAʿKHAEF)
TC III.12: 20 + x years
Manetho: Suphis (II) 66 years
Beckerath, *Chronologie*, 159: 26 years

rnpt zp
- 1, *ꜣbd IV ꜣẖt, sw 5*; ostracon from Helwan tomb 299 H 2[84]
- 5, *ꜣbd III prt, sw 22*; ostracon from Helwan tomb 335 H 2[85]
- 7, *ꜣbd IV prt, sw 10*; G 7530–40, Meresankh III[86]
- 7, *ꜣbd IV prt, sw 20*; G 7530–40, Meresankh III[87]
- 10, *ꜣbd III šmw, sw 24*; ostracon Leiden J 429[88]
- 10 (?), *ꜣbd III šmw, . . .*; G 7350, Hetepheres II (?)[89]
- 12, *ꜣbd II šmw, sw 10*; G 7650, Akhtihotep and his wife Meretites[90]

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[84] Z. Saad, *Royal Excavations at Saqqara and Helwan (1941–1945), Suppl. ASAE* no. 3 (Cairo, 1947), 106, pl. 42 a left; as Spalinger notes, "Texts", 287, Khephren's cartouche in the inscription clinches its assignment to his reign.

[85] Saad (n. 84), 107, pl. 43 at right; probably temp. of Khephren.

[86] Attributed to Khephren by D. Dunham & W. K. Simpson, *The Mastaba of Mersyankh III* (Boston, 1974), 3 fig. 1; see also Smith, "Evidence", 127 no. 9, 119 fig. 7.

[87] Attributed to Khephren by Dunham & Simpson (n. 86), 3 fig. 1; see also Smith, "Evidence", 127 no. 9, 119 fig. 7. Anthropological examination of Meresankh III's bones put her age at death at about fifty, see V. G. Callender, *Egypt in the Old Kingdom* (Melbourne, 1998), 172–173.

[88] According to H. Goedicke, *JEA* 54 (1968), 24, 28–29, pl. 5 no. 4, the ostracon is of the same date as those of Helwan; thus *rnpt zp* 10 probably refers to Khephren. Cf. also, *idem, Old Hieratic Palaeography* (Baltimore, 1988), pl. 16.

[89] According to Reisner (n. 73), 73 n. 2; see also Smith, "Evidence", 119 fig. 7, 127 no. 9. The date was inscribed on the back of a block from G 7350, purportedly built for Hetepheres II. However, Smith identified the figures ín the relief on the front as Hetepheres II (?) and Meresankh III (?), and he dated it to the time of Shepseskaf (*HESPOK*, 1946, 164–165, 302, pl. 45 a). The attribution of G 7350 to Hetepheres II is not based on textual evidence. P. Jánosi, *ZÄS* 123 (1996), 56–57, has questioned Smith's conclusions. He suggests that the relief might have originally shown an anonymous prince followed by his mother and his wife. No doubt the attribution of the date is fraught with difficulties, regardless of the fact that a high date and Shepseskaf's reign are mutually exclusive, which leaves either Khephren or Menkaureʿ. Since Meresankh III was probably buried in the tomb intended originally for her mother at the beginning of Menkaureʿ's reign (see the dates *rnpt zp* 1 and *rnpt (m-)ẖt zp* 1 sub Menkaureʿ), it would be surprising to find her represented with her mother in a tomb built as late as Menkaureʿ's reign. When considering the data from G 7350 and G 7530–40 and with due circumspection in view of the complex stratigraphy and unclear chronology of cemetery G 7000, one is inclined to assign the date to Khephren.

[90] Attributed to Khephren by Smith, "Evidence", 119 fig. 7, 127–128 no. 11 b; see also Reisner (n. 73), 73 n. 1. For doubts about the attribution to Khephren, and a still higher date of *rnpt zp* 13 (see below) from the tomb of Akhtihotep, see P. Jánosi, *Giza in der 4. Dynastie.* (Wien 2005), 71–73, 443.

- 12 *Tnwt* . . .; LG 87, Nikaure[91]
- 13, *ꜣbd IV* . . .; G 7650, Akhtihotep and his wife Meretites[92]

rnpt (m-)ḫt zp
- 4 *Tnwt, ꜣbd II šmw, sw 3*; ostracon from Helwan tomb 305 H 2[93]
- 4 *Tnwt, ꜣbd II šmw, sw 4*; ostracon from Helwan tomb 305 H 2[94]
- 5, *ꜣbd II šmw, sw 8*; ostracon from Helwan tomb 322 H 2[95]
- 5, *ꜣbd III prt, sw 22*; ostracon from Helwan tomb 335 H 2[96]

attested *rnpt zp*: 1, 5, 7, 10, 12, 13
attested *rnpt (m-)ḫt zp*: 4, 5
rnpt zp: rnpt (m-)ḫt zp—6: 2

BICHERIS
TC III.13 (?): . . .?. . . years
Manetho: 22 years (Bicheris, preceded by Ratoises, was inserted by Manetho between Mycerinus and Shepseskaf.)
Beckerath, *Chronologie*, 159: 7 years

MYCERINUS (MENKAUREʿ)
TC III.14 (?): 18 (28 ?) years
Manetho: Mencherés—63 years
Beckerath, *Chronologie*, 159: 28 years.

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[91] *Urk.* I, 16.14; see also H. Goedicke, *Die privaten Rechtsinschriften aus dem Alten Reich* (Wien, 1970), 21–22. There is no unanimity on the dating of the will of Khephren's son Nikaura. For instance, Strudwick (n. 79; 107) concluded that Nikaura should have been born in Khephren's reign, "and thus would be no older than twenty-two at the end of his father's reign". Consequently, *rnpt zp* 12 should then apply to Khephren's successor Menkaureʿ. With reference to art historical criteria and the replacement of *Tnwt* by *ipt* in the date (the former being supposed by Goedicke, *Rechtsinschriften*, 22, to have disappeared by the beginning of Dyn. 5), Spalinger ("Texts", 294) opts for Menkaureʿ, too. But Baud, *Ménès*, 128, argues that Khephren's name occurs in Nikaura's tomb with such an insistence that the date should refer to this king. Jánosi (n. 90), too, does not exclude the attribution of the date to Khephren, provided that Nikaura was born before his father ascended the throne. Taking all the arguments in account, including the possibility that Khephren might have become king later in his life, one is inclined to assign this date to him.

[92] Attributed to Khephren by Smith, "Evidence", 119 fig. 7, 128 no. 11.

[93] Saad (n. 84), 106–107, pl. 42 b right. For the translation and interpretation, see H. G. Fischer, *Orientalia* 29 (1960), 187–190; Spalinger, "Texts", 287.

[94] Saad (n. 84), 106–107, pl. 42 b left. For translation and the reference of the ostracon, see Fischer (n. 93), 187–90; see also Spalinger, "Texts", 287.

[95] Saad (n. 84), 107, pl. 43 a right; see Spalinger, "Texts", 288.

[96] Saad (n. 84), 106–107, pl. 43 b right; see Spalinger, "Texts".

rnpt zp
• 2, *ꜣbd II prt, sw 22*; G VI S[97]
• 2, *ꜣbd IV šmw, sw 22*; G 7530–40, Meresankh III[98]
• 11, *ꜣbd . . ., sw 10 + x*; G VI S[99]

The following dates from the Gebelein papyri can probably be attributed to Mycerinus:[100]

rnpt (m-)ḫt zp
• 2, *ꜣbd . . . ꜣḫt, sw 20*; Gebelein, frag. A[101]
• 3, *ꜣbd III prt, sw 26*; Gebelein, frag. B[102]
• 11, . . .; Gebelein, rouleau IV[103]

attested *rnpt zp*: 2, 11
attested *rnpt (m-)ḫt zp*: 2(?), 3(?), 11(?)
rnpt zp: rnpt (m-)ḫt zp—2: 3(?)

SHEPSESKAF
TC III.15 (?): 4 years
Manetho: Sebercherés—7 years
Beckerath, *Chronologie*, 159: 5 years

[97] Junker, *Giza* X, 75, fig. 35.9, 78, no. 10. With regard to the occurrence of this date on some blocks at the site, Junker attributed the date to Menkaureʿ because of the presence of his crew names.

[98] Dunham & Simpson, (n. 86), 3, fig. 1 e; see also Smith, "Evidence", 116 fig. 4, 126 no. 2. The date is inscribed to the north of the subsidiary niche, eastern façade, of the mastaba (from the date on the south side, only . . . *prt, sw* 17 survived). Reisner attributed the date to Khephren, see Smith, "Evidence"; Spalinger, "Texts", 286, accepts this dating, though with some hesitation. However, Reisner's dating can be seriously questioned. If the tomb was built around the 7th census of Khephren, as indicated by two masons' inscriptions (Simpson & Dunham (n. 86), 3, Fig. 1 b, c), the lower date found on the mastaba's façade can hardly be earlier. But to which event did the date refer? The attribution of the date to Menkaureʿ seems to be, therefore, more probable. For the complex, and the problem of its history, see Jánosi (n. 90), 500 and *idem*, *ZÄS* 123 (1996), 46–62.

[99] Junker, *Giza* X, 75 fig. 35.10, 77 no. 9; because Menkaureʿ's crew names were found on some blocks at the site, Junker attributed the date to his reign.

[100] P. Posener-Kriéger, *RdÉ* 27 (1975), 216 and *idem* in: *Fs Elmar Edel: 12. März 1979* (Bamberg, 1979), 318–331.

[101] Posener-Kriéger (n. 100; 1979), 318–331.

[102] Posener-Kriéger, *RdE* 27 (1975), 215–216.

[103] Posener-Kriéger, *RdE* 27 (1975), 215–216.

rnpt zmꜣ tꜣwy
- Palermo Stone[104]
- *ꜣbd II šmw, sw 10*;[105]
- *ꜣbd II šmw, sw 10*; G 5552[106]
- *ꜣbd III šmw, sw . . .*; G 7450[107]
- *ꜣbd IV šmw, sw 4*; G 7450[108]

rnpt zp
- 1, *ꜣbd* 1 *šmw, sw* 21 (G 753040, Meresankh III)[109]

rnpt (m-)ḫt zp
- *tpy, ꜣbd II prt, sw* 28[110]
- 1 *(n) ipt* (!) *iḥ ꜥwt nbt*; edict of Shepseskaf for the pyramid of Mycerinus[111]

attested *rnpt zp*: 1
attested *rnpt (m-)ḫt zp*: 1
rnpt zp: rnpt (m-)ḫt zp—1: 1

THAMPHTHIS
TC III, 16 (?): 2 years
Manetho: Thamphthis—9 years
Beckerath, *Chronologie*, 159: 2 years

USERKAF
TC III.17: 7 years
Manetho: Usercherés—7 years
Beckerath, *Chronologie*, 159: 8 years

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[104] Schäfer, "Annalen", 32–33.
[105] Attributed to Shepseskaf by Helck, in: *Fs Goedicke*, 107.
[106] Attributed to Shepseskaf by Helck (n. 105), 107–108.
[107] Attributed to Shepseskaf by Helck (n. 105), 107–108.
[108] The date to the right of the entrance to Meresankh III's chapel refers to the preparation of the queen's burial. Reisner attributed it to Shepseskaf, see Smith, "Evidence", 126, fig. 4, 118; Jánosi (n. 90), 501 concurs. But Dunham & Simpson (n. 86), 8, pl. 2 a, fig. 2, and also Spalinger, "Texts", 288–289, assign it to Menkaureꜥ.
[109] The date, inscribed on the left side of the entrance to Meresankh III's chapel and referring to the completion of the queen's burial, was attributed by Reisner to Shepseskaf, see Smith, "Evidence", 126, fig. 4 on p. 118. Jánosi (n. 90), 501, attributes the date to Shepseskaf, too. On the other hand, Dunham & Simpson (n. 86), 8, pl. 2 a, and also Spalinger, "Texts", 289, attribute the date to Menkaureꜥ.
[110] G. A. Reisner, *Mycerinus: The temples of the third Dynasty at Giza* (Cambridge, Mass., 1931), 278 no. 1; see also H. Goedicke, *Königliche Dokumente aus dem Alten Reich* (Wiesbaden: ÄA 4, 1967), 16–17, fig. 1 and P. Jánosi, *GM* 141 (1994), 49–54.
[111] Schäfer, "Annalen", 34.

rnpt zp
- 3; Palermo Stone, verso 2[112]
- 3, *ꜣbd III prt*, *sw* . . .; sun temple of Userkaf[113]

rnpt (m)-xt zp
- 1 *(n) ṯnwt*; Cairo frag. no. 1 recto 2[114]

attested *rnpt zp*: 3
attested *rnpt (m)-xt zp*: 1
rnpt zp: rnpt (m)-xt zp, 1: 1

SAHUREʿ
TC III 18 (?): 12 years
Manetho: Sephrés—13 years
Beckerath, *Chronologie*, 155: 13 years

rnpt zp
- 1; Cairo Frg. no. 1 verso 2[115]
- 2, *ꜣbd I šmw, sw 20*; mason's inscription, mortuary temple of Sahureʿ[116]
- 4, *ꜣbd IV ꜣḫt, sw 12*; masons' inscription, mortuary temple of Sahureʿ[117]
- 5, *ꜣbd I ꜣḫt*; sun temple of Userkaf, tablet A[118]
- 5, *ꜣbd III prt*; sun temple of Userkaf, tablet B[119]
- 5, *ꜣbd III šmw*; sun temple of Userkaf, tablet C[120]

rnpt (m)-xt zp
- 2 (Palermo Stone, verso 3)[121]
- 5, *ꜣbd II prt*; sun temple of Userkaf, tablet D[122]
- 6; Palermo Stone, verso 4[123]

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[112] Schäfer, "Annalen", 34.
[113] Haeny, in: *BÄBA* 8 (1969), 41–42 no. 6.
[114] Gauthier (n. 15), 45–46, pl. 26.
[115] Gauthier (n. 15), 47.
[116] L. Borchardt, *Das Grabdenkmal des Königs Sahure I*, (Leipzig, 1910), 88, M 26.
[117] Borchardt (n. 116), 89, M 29.
[118] Probably to be attributed to Sahureʿ, see Verner, "Remarks", 386–390.
[119] Probably to be attributed to Sahureʿ, see Verner, "Remarks", 386–390.
[120] Probably to be attributed to Sahureʿ, "Remarks", 386–390.
[121] Schäfer, "Annalen", 36–37.
[122] Probably to be attributed to Sahureʿ, see Verner, "Remarks", 386–390.
[123] Schäfer, "Annalen", 38–39. To date, this is the highest contemporaneous date attested for Sahureʿ's reign. A. Roccati, *La littérature historique sous l'Ancien Empire* (Paris, 1982), 48, for instance, read the worn signs as 7 and, provided the census was biennial, evidence for year 15 of Sahureʿ's reign. However, as pointed out by Wilkinson (*Annals,* 168), 6 is a more likely reading than 7; in case of a biennial census, it would refer to year 13.

attested *rnpt zp*: 1, 2, 4, 5
attested *rnpt (m)-xt zp*: 2, 5, 6
rnpt zp: rnpt (m)-xt zp, 4: 3

*NEFERIRKARE*ʿ
TC III.19 (?): length of reign lost
Manetho: Nefercherés—20 years
Beckerath, *Chronologie*, 155: 20 years

rnpt zmꜣ tꜣwy; Palermo Stone verso 4[124]

rnpt zp
- 5; Palermo Stone verso 5[125]
- 5, *ꜣbd IV ꜣḫt, sw 4*; mason's inscription, pyramid of Khentkaus II[126]
- 5, *ꜣbd IV*; mason's inscription, pyramid of Neferirkareʿ[127]

attested *rnpt zp*: 5
rnpt m-ḫt zp: not attested
rnpt zp: rnpt m-ḫt zp—1: 0

*SHEPSESKARE*ʿ
TC III.20 (?): 7 years
Manetho: Sisirés—7 years
Beckerath, *Chronologie*, 155: 7 years

RAʿNEFEREF
TC III.21 (?): 1 year
Manetho: Cherés—20 years
Beckerath, *Chronologie*, 155: 11 years

rnpt zp
- *tpy, ꜣbd IV ꜣḫt sw* 4 + x; pyramid of Raʿneferef[128]

attested *rnpt zp*: 1
rnpt (m-)ḫt zp: not attested
rnpt zp: rnpt (m-)ḫt zp—1: 0

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[124] Schäfer, "Annalen", 39.
[125] Schäfer, "Annalen", 40.
[126] Probably to be attributed to Neferirkareʿ, see Verner, *ZÄS* 107 (1980), 159, fig. 3; *idem The Pyramid Complex of Khentkaus* (Prague, 1995), 43–45.
[127] L. Borchardt, *Das Grabdenkmal des Königs Nefer-ir-keꜣ-re*ʿ (Leipzig, 1909), 46 and n. 6.
[128] Corrected copy: Verner, *ZÄS* 126 (1999), 76, fig. 6.

NEUSERREʿ
TC III.22 (?): 11 (+ x years ?)
Manetho: Rathurés—44 years
Beckerath, *Chronologie*, 155: 31 years; cf. ibidem 208, where the figure 30—or 20 ? + 1 or 5 ?—is given

rnpt zm3 (t3wy)
• unpublished potsherd no. 763/I/84–x, mortuary temple of Raʿneferef

rnpt zp
• 1, *ȝbd I ȝḫt, sw 10 + x*; unpublished potsherd no. 531/I/82, mortuary temple of Raʿneferef
• 1, *ȝbd tpy ȝḫt*, . . .; unpublished potsherd no. 763/I/84–e, mortuary temple of Raʿneferef
• 2, *ȝbd III šmw, sw 10*; a potsherd found by Borchardt[129] in (or to the west of ?) the mastaba of Djadjamankh in Abusir
• 5 (?), *ȝbd III prt, (sw) wpw*; masons' inscription, mastaba of Ptahshepses[130]
• 7, *ȝbd III ȝḫt, sw 1* (or *7* ?); jar for beef fat no. 531/I/82, mortuary temple of Raʿneferef

rnpt (m-)ḫt zp
• 2, *ȝbd 3 ȝḫt, sw* 24; masonry block, found in the southern "Eckbau" of the mortuary temple of Neuserreʿ[131]

attested *rnpt zp*: 1, 2, 5(?), 7
attested *rnpt (m-)ḫt zp*: 2
rnpt zp: rnpt (m-)ḫt zp—4(?): 1

MENKAUHOR
TC III.23: 8 years
Manetho: Mencherés—9 years
Beckerath, *Chronologie*, 155: 9 years

DJEDKAREʿ
TC III.24: 28 years
Manetho: Tancherés—44 years
Beckerath, *Chronologie*, 155: 38 years

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[129] L. Borchardt, *Das Grabdenkmal des Königs Ne-user-rʿ* (Leipzig, 1907), 139.
[130] To be attributed to Neuserreʿ: M. Verner, *Baugraffiti der Ptahschepses Mastaba* (Prague, 1992), 110, graffito no. 194.
[131] Borchardt (n. 129), 145.

rnpt zm3 t3wy
• *3bd III prt, sw 29*; tomb of Wepemneferet[132]

rnpt zp
• 1, *3bd II 3ḫt*, . . .; unp. pap., (mortuary temple) archive of Raʿneferef, pl. 51 A
• *rnpt tpy* (*sic*), . . .; unp. pap., archive of Raʿneferef, pl. 76 A
• 3, *3bd IV 3ḫt, sw 25*; papyrus archive, temple of Neferirkareʿ[133]
• 5, *3bd IV 3ḫt*, . . . unp. pap., archive of Raʿneferef, pl. 76 C
• 6, *3bd IV prt, sw 22*; wooden box for linen found in the tomb of Nefer and Kahay[134]
• 8, *3bd IV šmw*; papyrus archive, mortuary temple of Neferirkareʿ[135]
• 9; rock stela, Sinai[136]
• 10, *3bd IV . . ., sw 24*; papyrus archive, mortuary temple of Neferirkareʿ[137]
• 11, *3bd II 3ḫt, sw 11*; papyrus archive, mortuary temple of Neferirkareʿ[138]
• 14, *3bd tpy šmw (3bd II šmw)*; papyrus archive, mortuary temple of Neferirkareʿ[139]

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[132] The date, mentioned in Wepemneferet's will on a wall of his tomb (S. Hassan, *Giza* II, Cairo, 1936, fig. 219), was attributed by Spalinger ("Texts", 302, with a reference to K. Baer, *Rank and Title in the Old Kingdom*, Chicago, 1960, 66) to Wenis. However, the persons mentioned in the tomb include a craftsman named Raʿneferef-ankh. If born in the reign of Raʿneferef, which seems probable, he could have been about 30 to 40 years old at the beginning of Djedkareʿ's reign. If this date be ascribed to Wenis, he would have been very old at the time of that king's acession. The date should, therefore, refer to Djedkareʿ rather than Wenis.

[133] Posener-Kriéger & de Cenival, *Abusir Papyri*, pls. 13, 13 A; Posener-Kriéger, *Archives* II, 480.

[134] H. Altenmüller & A. Moussa, *The Tomb of Nefer and Kahay* (Mainz: *AV* 5, 1971), 18, 43–44, fig. 11. The excavators assigned the date to Djedkareʿ. However, Spalinger, "Texts", 302 suggested either Raʿneferef or Neuserreʿ. Surely Raʿneferef can be excluded (see above sub Raʿneferef). The tomb seems to have been built in the time of Neuserreʿ, as the excavators surmised; see also, e.g., N. Cherpion, *Mastabas et Hypogées de l'ancien Égypte* (Bruxelles, 1989), 135. However, as pointed out by Altenmüller & Moussa, the burial in shaft no. 8, where the box with the date was found, was the last one made in the tomb and should be contemporary with Nefer's children. The dating of the inscription to the time of Djedkare is, therefore, very plausible.

[135] Posener-Kriéger, de Cenival, *Abusir Papyri*, pls. 69, 69 A; Posener-Kriéger, *Archives* II, 490.

[136] A. H. Gardiner, T. E. Peet & J. Cerný, *The Inscriptions of Sinai* I (London, 1952), pl. VIII, no. 14; II, 61.

[137] Posener-Kriéger & de Cenival, *Abusir Papyri*, pls. 72, 72 A; Posener-Kriéger, *Archives* II, 490.

[138] Posener-Kriéger & de Cenival, *Abusir Papyri*, pls. 53, 53 A; Posener-Kriéger, *Archives* II, 490.

[139] Posener-Kriéger & de Cenival, *Abusir Papyri*, pls. 2, 2 A; Posener-Kriéger, *Archives* II, 490.

- 15, *ꜣbd IV prt, (sw) wpw*; papyrus archive, mortuary temple of Neferirkareʿ[140]
- 15, *ꜣbd IV ꜣḫt, sw 27*; unp. pap., archive of Raʿneferef, pl. 20 B
- 15, *ꜣbd IV ꜣḫt, sw 28*; unp. pap., archive of Raʿneferef[141]
- 15, *ꜣbd I*, . . .; unp. pap., archive of Raʿneferef, pl. 21 L
- 15 *(n) T(nwt)*; unp. pap., archive of Raʿneferef, pl. 3 A
- 16; papyrus archive, mortuary temple of Neferirkareʿ[142]
- [1]6, *ꜣbd IV šmw, sw 28*[143]
- 17, *ꜣbd III*; unp. pap., archive of Raʿneferef, pl. 8 D
- 18, *ꜣbd III šmw, sw ʿrq*; unp. pap., archive of Raʿneferef, pl. 45
- 18, *ꜣbd IV šmw, sw ʿrq*; unp. pap., archive of Raʿneferef, pl. 63 A
- 21 (22 ?), *ꜣbd IV ꜣḫt, sw 12*; papyrus archive, mortuary temple of Neferirkareʿ[144]

damaged evidence of *rnpt zp*
- 2 + x, *ꜣbd I . . ., sw . . .*; unp. pap., archive of Raʿneferef, pl. 76 B
- 10 + x; unp. pap., archive of Raʿneferef, pl. 85 C
- 11 + x *Tnw(t) iḥ (ʿwt nb)*; unp. pap., archive of Raʿneferef, pl. 1 A.

rnpt (m-)ḫt zp
- 1, *ꜣbd IV ꜣḫt, sw ʿrq*; unp. pap., archive of Raʿneferef, pl. 77 A
- 1, *ꜣbd IV šmw, sw 1*; unp. pap., archive of Raʿneferef, pl. 77 B
- *tpy*; unp. pap., archive of Raʿneferef, pl. 82 0
- 3; rock stela, Sinai.[145]
- 4, *ꜣbd III šmw, sw 15*; unp. pap., archive of Raʿneferef, pl. 76 C.
- 4, *ꜣbd III šmw*; unp. pap., archive of Raʿneferef, pl. 69 A
- 7 (?), *ꜣbd I ꜣḫt*; unp. pap., archive of Raʿneferef, pl. 76 D
- 10, *ꜣbd IV šmw, sw 21*; papyrus archive, mortuary temple of Neferirkareʿ[146]

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140 Posener-Kriéger & de Cenival, *Abusir Papyri*, pls. 47, 47 A; Posener-Kriéger, *Archives* II, 490.

141 Posener-Kriéger, in: *Mélanges Mokhtar* II (Cairo, 1985), 195–210.

142 Posener-Kriéger & de Cenival, *Abusir Papyri*, pls. 1, 1 A; Posener-Kriéger, *Archives* II, 490.

143 *Urk* I, 63.11; W. S. Smith, "Evidence", 113 n. 2; see also E. Eichler, *SAK* 18 (1991), 146–147 (letter of Izezi to Senedjemib).

144 Posener-Kriéger & de Cenival, *Abusir Papyri*, pls. 41, 41 A; Posener-Kriéger, *Archives* II, 490. Posener-Kriéger transcribed the numeral following *rnpt zp* as 21. There is, however, the trace of another vertical stroke which allows the reconstruction '22'.

145 Gardiner et al. (n. 136), I, pl. VII, no. 13; II, 60.

146 Posener-Kriéger & de Cenival, *Abusir Papyri*, pls. 14, 14 A; Posener-Kriéger, *Archives* II, 490.

- *rnpt zp (m)-xt zp* (sic) 14, *ꜣbd I ꜣḫt, sw 28*; unp. pap., archive of Raʿneferef, pl. 66 B
- 14, *ꜣbd . . . ꜣḫt*; unp. pap., archive of Raʿneferef, pl. 76 J
- 17, *ꜣbd I šmw* (?), *sw 23*; sarcophagus of Idu, Abusir[147]

damaged evidence of *rnpt (m)-xt zp*

- 4 + x, *ꜣbd I ꜣḫt*; unp. pap., mortuary temple archive of Raʿneferef, pl. 77 I
- 10 + x, . . .; unp. pap., mortuary temple archive of Raʿneferef, pl. 76 E

documents dating from the time of either Djedkareʿ or Wenis:

- *rnpt zp* 4, *ꜣbd IV prt, sw 2*; papyrus archive, mortuary temple of Neferirkareʿ[148]
- *rnpt zp* 4, *ꜣbd I šmw, sw ʿrq*; papyrus archive, mortuary temple of Neferirkareʿ[149]
- *rnpt zp* 11, *ꜣbd III prt, sw 3* (?); mason's inscription, tomb of Rawer II[150]

attested *rnpt zp*: 1, 3, 4(?), 5, 6, 8, 9, 10, 11, 14, 15, 16, 17, 18, 21 (22?)
attested *rnpt (m)-xt zp*: 1, 3, 4, 7 (?), 10, 14, 17
rnpt zp: rnpt (m)-xt zp, 15(?): 7(?)

WENIS
TC III.25: 30 years
Manetho: Onnos—33 years
Beckerath, *Chronologie*, 155: 20 years

[147] M. Verner, *SAK* 8 (1980), 258–260, pl. 16. A new examination of the badly damaged inscription showed that the date should be read *rnpt (m-)ḫt zp* 17 rather than *rnpt zp* 14, as suggested shortly after the discovery of the tomb.

[148] Posener-Kriéger & de Cenival, *Abusir Papyri*, pls. 11, 11 A; Posener-Kriéger, *Archives* II, 491, was hesitant about the attribution of this date to either Djedkareʿ or Wenis.

[149] Posener-Kriéger & de Cenival, *Abusir Papyri*, pls. 11, 11 A; Posener-Kriéger, *Archives* II, 491 was hesitant about the attribution of this date to either Djedkareʿ or Wenis.

[150] Junker, *Giza* III, 223–235; *idem Giza* VIII, 39f. Though a sealing bearing the name of Djedkareʿ was found in the tomb, the attribution of the date to him is somewhat uncertain. Nevertheless Baer (n. 132), 98, assigned the tomb to the end of Dyn. 5, while Harpur (n. 72), 213, dates it mid-Djedkareʿ to Wenis.

rnpt zp
- 3, *ꜣbd IV ꜣḫt, sw 11*; mason's inscription, anonymous mastaba "L", Abusir[151]
- 6, *ꜣbd II šmw, sw 28*
- 8, *ꜣbd IV šmw*; papyrus archive, mortuary temple of Neferirkareʿ[152]

rnpt (m)-xt zp
- 4, *ꜣbd I prt*[153]

Concerning several dates whose attribution is uncertain (Djedkareʿ or Wenis), see above under Djedkareʿ.

attested *rnpt zp*: 3, 6, 8
attested *rnpt (m)-xt zp*: 4
rnpt zp: rnpt (m)-xt zp, 3: 1

Postscript.—Unfortunately, the edition of this volume has been delayed by four years. In the meantime, there has appeared some new information relating to the subject of my article to which I could not respond. For instance, a work by J. S. Nolan (The Original Lunar Calendar and Cattle Counts in Old Kingdom Egypt in: AH 17, 2003, 75–97) offering the explanation of the imbalance between the "years of an occasion" and "years after an occasion" in the contemporaneous Old Kingdom documents. Moreover, some new conclusions concerning the dated documents of the late Fifth Dynasty eventuated as a result of an examination of the papyri from Raneferef's mortuary temple archive (see P. Posener-Kriéger, M. Verner, H. Vymazalová, The Pyramid Complex of Raneferef. The Papyrus Archive, in press). It is thus a matter of some regret that this article could not be as comprehensive as I would have liked.

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[151] M. Verner & V. Callender, *Djedkave's Family Cemetery* (Prague, 2002), 103.
[152] Posener-Kriéger & de Cenival, *Abusir Papyri*, pls. 54 c, 54 A c; Posener-Kriéger, *Archives* II, 491.
[153] Posener-Kriéger & de Cenival, *Abusir Papyri*, pls. 50, 50 A; Posener-Kriéger, *Archives* II, 491.

II. 5 THE RELATIVE CHRONOLOGY OF DYNASTIES 6 AND 8

Michel Baud

Although data are quite abundant for Dyn. 6 and derive from a variety of sources (royal annals and decrees on stone, administrative documents on papyrus, expedition graffiti), the interpretation of the dating system used by the monarchy remains controversial. For this period, the dogma of the biennial census has been challenged in the most recent studies, especially in the compilations of Spalinger[1] and Helck[2] prior to the publication of the South Saqqara Stone, with the royal annals of Dyn. 6.[3] In theory, the discovery of such a monument might be expected to clarify chronological questions, since the text is organized in year-compartments ending with the citation of the year, either of the census type (*rnpt zp*) or post-census type (*rnpt m-ḫt zp*). But unfortunately, the inscriptions were quite systematically erased prior to the reuse of the slab as a sarcophagus lid, so that neither the demarcation of the compartments (which may in any case have been painted, rather than carved) nor most of the dates are preserved. Documents of significantly later date, such as the *TC*, do not provide any help for evaluating the dynasty's duration, or the lengths of individual reigns. Most, if not all, of the figures preserved are at odds with contemporaneous OK data, despite repeated efforts to reconcile the two.[4] Therefore, the value of the papyrus lies more in the realm of historiography than in chronology.[5]

[1] Spalinger, "Texts", 275–319.

[2] W. Helck, "Gedanken zum Mord an König Teti", in: *Fs Goedicke*, 108–109.

[3] Baud & Dobrev, "Annales", 30–31; Baud & Dobrev, "Le verso des annales de la VIe dynastie, Pierre de Saqqara-Sud", *BIFAO* 97 (1997), 35–42.

[4] See Beckerath, *Chronologie*, 147–152.

[5] Baud, "Ménès", 126–132.

Reign of Teti

No dates are preserved on the annals (recto, first register),[6] and the absence of lines dividing year-compartments does not even allow an estimate of the reign's total length. The space allotted Teti seems much too small to accommodate the available data; most likely, the monument displayed a summary of the reign with compartments of very reduced size. Possibly what was initially considered the recto is rather the verso,[7] but arguments in favour of this are weak.[8]

The Abusir archive from the funerary temple of Neferirkareʿ provides a number of dates for the early part of Teti's reign.[9] All come from pBerlin 10.474A–B recto and verso (*HPBM* V, 1969, pl. 92–95), a narrow roll which belongs to a single reign, as is obvious from the coherent time span of the recorded dates. Teti's *serekh* (pl. 94) clearly identifies the sovereign, at least for the left document of the presumed verso preserving the earliest dates:

- *[rnpt (m)-ḫt zp 1], III prt sw ʿrḳ(y); rnpt (m)-ḫt zp 1 [III prt] sw 10; rnpt [(m)-ḫt zp 1] III prt sw 9*, in reverse order (pl. 94, left doc.), to which the recto adds two:
- *rnpt (m)-ḫt zp 1, III šmw sw 3* (pl. 94, right doc.),
- *rnpt (m)-ḫt zp [1], IV šmw sw [x]* and *rnpt zp 2, II šmw sw 3*, in normal order (pl. 92).

pBerlin 15.729 verso (pl. 103) provides another date: *[rnpt] (m)-ḫt zp [x], I ꜣḫt sw 3*, but the year is missing and the identity of the king remains uncertain. It should not be Teti,[10] since the recto displays a basilophorous name citing a king Pepy[11] (not necessarily Pepy II). Whatever the numeral was, this document provides another example of a post-census year.

[6] Baud & Dobrev, "Annales", 23–92.
[7] V. Dobrev, "The South Saqqara Stone and the sarcophagus of Queen Mother Ankhesenpepy", in: M. Barta & J. Krejci, eds., *Abusir and Saqqara in the Year 2000* (Prague: Archiv Orientální Supplementa 9, 2001), 382–384.
[8] Baud & Dobrev, "Annales", 54; Baud & Dobrev (n. 3; 1997), 38.
[9] Posener-Kriéger, *Archives* II, 491.
[10] Helck, *Fs Goedicke.*
[11] Posener-Kriéger, *Archives* II, 491.

Other dates for the reign of Teti are:

- *rnpt (m)-ḫt zp 6, III šmw sw [x]*: a graffito at the alabaster quarry of Hatnub (gr. no. 1);[12]
- *rnpt zp 11, I ꜣḫt sw 20*: an ink inscription in the tomb of Nykau-Izezi (Teti Cemetery, Saqqara), added to a scene of fowling in the marshes, just above the boat in which the owner stands.[13] The inscription dates the official's burial "the 11th count, I *ꜣḫt sw* 20: burial in the necropolis of the prince, the treasurer of Lower Egypt, Nykau-Izezi". Although a king's name is not mentioned, all arguments favour the reign of Teti. By doubling the number of "occasions" hitherto known, this new date raises several questions (see below).

Reign of Userkareʿ

The South Saqqara royal annals,[14] demonstrate conclusively the existence of this king, but almost nothing remains of the section in the middle of the uppermost register devoted to his reign. The available space between the titularies of Teti and Pepy I, when compared to the size of an average year compartment of the latter, indicates that Userkareʿ's reign must have been brief, from two to four years. This conclusion is consistent with the very few monuments of this king, mostly seal impressions, so far recovered. The silence of contemporaneous private biographies is disturbing. A funerary complex planned but never erected, is a better explanation for this absence than a speculative *damnatio memoriae*.[15] Regardless, the chronographic purpose of the royal annals did not allow the omission of this king, whatever form his titulary may have taken.

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[12] Eichler, E., *Untersuchungen zum Expeditionswesen des ägyptischen Alten Reiches* (Wiesbaden, 1993), 41, no. 36.

[13] (a) N. Kanawati & M. Abder-Raziq, *The Teti Cemetery at Saqqara VI. The Tomb of Nikauisesi* (Warminster: ACE Reports 14, 2000), pl. 50; (b) N. Kanawati, "A new *ḥꜣt/rnpt-zp* for Teti and its implication for Old Kingdom chronology", *GM* 177 (2000) 25–32.

[14] Baud & Dobrev, "Annales", 28, 53, 59–62.

[15] R. Stadelmann, "König Teti und der Beginn der 6. Dynastie", in: *Fs Leclant* I, 335.

Reign of Pepy I

Again, the discussion must start with the data preserved in the annals stone from South Saqqara. The reign extends from the last third of the first register (A) to the very beginning of the fifth (E). Although there is again no demarcation of year-compartments, traces of a number of memorial formulae (*nswt bjt Ppy jrn.f m mnw.f*) provide clues for reconstructing the original layout.[16] The twelve surviving formulae (M3–M14) are spaced at rather regular intervals (× 2 or × 3 where one, or perhaps two formulae are lacking), which supports as estimate of the original number at up to 25. Since both "occasion" and "after-occasion" years are known for the reign, obviously each *mnw*-formula was associated with a pair of years, a census year and a post-census year, presuming a regular biennial system.

Contrary to the *editio princeps* of the monument,[17] it is, however, by no means certain that a single heading systematically covered two years. Some compartments, especially at the beginning of a register, indeed appear much larger than others (see especially M5, second reg., and one formula before M10, fourth reg.). Therefore, it is tempting to conclude that they group two different years, by contrast to the others, which represent the vast majority of the (theoretical) compartments. But there are a number of objections to such a radical proposition. First, the size of a compartment might vary slightly according to the number of available and/or relevant data that needed to be recorded for posterity, as exemplified by the difference between the first and the second register where the average distance between successive *mnw* is respectively 30 and 40 cm. For years of crucial importance to the monarchy, such as the royal jubilee, the compartments could have been much larger than the average, although this is not an absolute necessity (cf. the minimal size of the first year, dedicated to the coronation rites). Secondly, there is at least one surviving example of two years grouped in a (theoretical) compartment of average size, reg. D, formula following M11 (hereafter M11 + 1). The date preserved here, a census year, occupies the middle of the available space and not the end, as anticipated for the case of a single year covered by its own *mnw*-formula. Nonetheless, if it is possible that most of the memorial

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[16] Baud & Dobrev, "Annales", 50–53.
[17] Baud & Dobrev, "Annales", 50–52, fig. 19.

formulae grouped census and post-census years together, the present condition of the stone leaves some doubt about the generalization of such a layout. Only parallel evidence from other sources might help to solve this problem. The dates preserved in the annals are indeed very few for the reign of Pepy I, and not unproblematic as regards their reading:

- *rnpt zp 18* (reg. D, M11 + 1, text zone D4);
- *rnpt (m)-ẖt zp 23* (reg. E, M14 + 1, text zone E7);
- *rnpt [m-ḫt ?] zp 25* (reg. E, M14 + 3, text zone E8).

These high counts are also attested in several expedition graffiti[18] and a royal decree:[19]

- *rnpt (m)-ḫt zp 18, III šmw sw 27*: Wadi Hammamat graffito no. 107, mentioning the first jubilee;
- *rnpt m-ḫt zp 18, IV šmw sw 5*: Sinai graffito no. 16, mentioning the first jubilee;
- *rnpt zp 21, I prt sw 23*: decree for the Pyramid complex of Snofru, Dahshur;[20]
- *rnpt zp 25, I ꜣḫt sw [x]*: Hatnub quarry graffito no. III, once more associated with the first jubilee.

Major clearance work at the king's pyramid, South Saqqara, 1987–88 and 1993–97, revealed a few dates among the great number of masons' marks.[21] Most did not include the year but, according to common practice,[22] only a season, month and day.[23] A block from the eastern end of the south side is a notable exception.[24] After the group *rnpt(?)-zp* there is an hieratic sign, which at first sight reads 30, followed by two vertical strokes. Such a high date, count 32 (or even 22), from an early

[18] Eichler (n. 12), nos. 133, 16, 30.
[19] Spalinger, "Texts", 303–304.
[20] Goedicke, *Dokumente*, 55–77, fig. 5.
[21] A. Labrousse, *L'architecture des pyramides à textes. II, Saqqara Sud*, (Cairo: BdE 131, 2000), 1–2.
[22] For the mastaba of Ptahshepses see M. Verner, *Abusir II. Baugraffiti der Ptahschepses-Mastaba* (Prague, 1992), 176–198.
[23] V. Dobrev, "Observations sur quelques marques de la pyramide Pépi Ier", in: *Fs Leclant* I, 150–151.
[24] Dobrev, pers. comm. 1994; see also F. Raffaele in 2001, "Sixth Dynasty Annals. The South Saqqara Stone", http://members.xoom.it/francescoraf/hesyra/ssannals.htm. The mark is visible in Labrousse (n. 21), fig. 10, but at a very reduced scale.

stage of the construction (corresponding to the 5th course of revetment blocks), leaves some doubt about this reading. Furthermore, since the highest count of the reign is 25, as confirmed by both the royal annals and the other contemporary data, the only satisfactory solution is to suppose that a double system of counting, one annual, the other biennial (whether regular or not) existed. The annual *rnpt-zp* 32 should be therefore equated with a lesser number of biennial census counts, at least 16 if regular. (Note that an anomalous group of 19 strokes in two rows (10 + 9) just before the date is obviously a calculation of some sort, not necessarily connected to the dating system). At present, and until adequate publication, this intriguing problem defies solution. Conceivably, it may eventually provide a key to explaining the contradictory dates for the king's first jubilee.

The date of Pepy's first *heb-sed* is controversial, since it is associated with two different years, counts 18+ and 25.[25] Taking the two figures at face value, they would have been separated by at least 6 years (systematically excluding post-census dates in this period, which is unlikely), and as many as 12 (with systematic post-census years). Therefore, the significance of both or either might reasonably be challenged, and could attest the prevalence of the *Wunsch-Idee* in the mention of the jubilee, for the benefit of the king's longevity.[26] A strictly historical/chronological interpretation is, however, still possible. Spalinger ingeniously envisaged the existence of two parallel dating systems at this period, one annual, i.e., 25 counts, the other (irregularly) biennial, i.e., 18 census counts, plus presumably 7 post-census.[27] Although interpretation of building graffiti may support this hypothesis, there remains the very confusing consequences of such a theoretical double system, both citing all years simply *rnpt-zp*. Furthermore, Spalinger has not considered one important factor: the context in which the dates are actually associated with the jubilee. As for the Sinai relief, there is no direct equation between the first jubilee and the date of the expedition. And though the scene depicts the royal ceremony in a format typical of an

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[25] These do not refer to two different jubilees as P. O'Mara ("Dating the Sed-Festival: Was there a Single Model?", *GM* 136 [1993], 57–70) thought, nor can the second belong to Pepy II (as proposed by J.v. Beckerath, "Gedanken zu den Daten der Sed-Feste", *MDAIK* 47 [1991], 30; tentatively Eichler [n. 12], 39).

[26] E. Hornung, "Sedfest und Geschichte", *MDAIK* 47 (1991), 169–171; with earlier literature.

[27] Spalinger, "Texts", 305–306.

year compartment in the annals, it is an all too frequent royal tableau to be taken as a true date.[28]

The same may possibly hold true for the other inscriptions, although the same historical connection between the Sinai and the Hammamat graffiti, both under count 18+, end of the *shemu*-season, may not be fortuitous.[29] However, a tendency to mention the jubilee repeatedly in the years following its celebration apparently existed,[30] for example, in connection with intense building activity at the royal funerary complex, down until the very end of the reign (i.e., count 25). Here again, the royal annals furnish a new argument favouring this hypothesis. Between the mention of count 18 and the next memorial formula which belongs to count 19, end of register D, the available space for count 18+ is the expected half of the average size of a theoretical compartment. It is hard to believe that such a narrow space corresponds to the jubilee celebration, which obviously had a considerable importance for this (and every) king, as is documented, for example, by the number of stone vessels celebrating the event.[31] (Count 25, the very last compartment of the annals, is of course excepted). By contrast, the longest compartment of the reign—more than half again the average length—is M10–1 (i.e., one formula before the preserved M10) at the beginning of register D. Fortuitously or not, this compartment corresponds precisely to year 30/31, if a strictly biennial system of numbering is presumed.[32] This could also explain why the handful of documents dated to the first jubilee did not cite any other date. For example, decree Coptos A simply epitomized the rule for the renewal of the king's powers after 30 years.[33]

Specialists, however, remain divided on whether this rule obtained during the OK.[34] There would therefore be no necessity to place the

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[28] See, too, two inscriptions recording Merenreʿ's visit to the First Cataract area to receive the hommage of Nubian chief(s). One displays a real date (count 5, see infra), reign of Merenreʿ; the other only a pictorial *zema-tawy* (*Urk. I*, 111), which may be indicative of the theoretical date—the coronation year—in which such an event would have taken place.

[29] J. Vercoutter, *L'Égypte et la vallée du Nil, 1: Des origines à la fin de l'Ancien Empire* (Paris, 1992), 326.

[30] See Hornung (n. 26), 170.

[31] A. Minault-Gout, "Sur les vases jubilaires et leur diffusion", in C. Berger & B. Mathieu, eds., *Fs Jean-Philippe Lauer* (Montpellier, 1997), 305–14.

[32] Raffaele (n. 24).

[33] Goedicke, *Dokumente*, 41–54, fig. 4.

[34] For the range of interpretations see Beckerath (n. 25), Hornung (n. 26), O'Mara (n. 25), A. A. Krol, "The representation of the 'Sed-Platform' in the Early Dynastic monuments", *GM* 184 (2001), 27–37.

jubilee as late as year 35/36,[35] nor to equate *rnpt zp* 18+, presuming Userkareʿ was a usurper, with a canonical year 30 of strictly personal rule,[36] an assumption invalidated by the royal annals.[37]

Reign of Merenreʿ

The last register (F) of the recto of the Dyn. 6 annals is dedicated to the first years of this reign. The number of compartments is uncertain, but five or six is a reasonable estimate.[38] The dates preserved are:

- *rnpt zmꜣ-tꜣwy*, associated with the first memorial formula (M15) of the register (text zone F1);
- *rnpt zp 1 (+ 1?)*, with the second formula (M16, zone F3);
- *rnpt (m)-ḫt zp 1 (+ 1?)*, probably with the next formula, not preserved (zone F5).

In our initial publication, we logically assumed that the two last dates were to be read as counts 2 and 2+, since in these annals, the Unification of the Two Lands was apparently considered a year of cattle census (the expression *ṯnwt jḥ* does follow the date). After this first census (count 1), a compartment was tentatively delineated to account for a post-census year after the Unification,[39] considering that for such years also the system remained biennial. Although this remains a possibility, there are weaknesses in such a reconstruction. In the first place, this so-called count 1+ would be confined to a very narrow space, when compared to the other very broad compartments of the last register.[40] Secondly, the figure of the next date consists of a very deeply carved single stroke,[41] and it is unlikely that another stroke ever existed; there is also no space available for an alleged second stroke under the *zp* sign. It may not be mere chance that the next date also retains only a stroke. These two dates should be read accordingly as counts 1 and 1+, even if the first year of the reign was labelled census year. Should the succeeding years be read 1/1+ or 2/2+, it is nonetheless clear that this

[35] Contra e.g., H. Goedicke, "Two Mining Records from the Wadi Hammamat", *RdE* 41 (1990), 65–93, at 67, and O'Mara (n. 25).

[36] Contra Spalinger, "Texts", 305–306.

[37] Baud & Dobrev, "Annales", 61–62.

[38] Baud & Dobrev, "Annales", 48–49, 54.

[39] Baud & Dobrev, "Annales", fig. 19.

[40] Baud, "Ménès", 123–124.

[41] Baud & Dobrev, "Annales", pl. VII c.

period experienced a biennial census. Since a year 5+ is also known (see below) and since it is likely that the document did not end abruptly in mid-reign, it must be concluded that the reign continued on the verso (see above, *contra* Dobrev),[42] even if the titulary of this king probably featured in the introductory column of the recto, as recently proposed, citing new and convincing arguments.[43] Other sources are restricted to two rock inscriptions:[44]

- *rnpt zp 5, II šmw sw 28*, First Cataract area, Urk. I, 110, 12;
- *rnpt (m)-ḫt 5*, Hatnub graffito no. VI.[45]

Once again, it is clear that the latest years of the reign experienced a biennial system.

Reign of Pepy II

Spalinger's list[46] remains relatively current and must be consulted for further references:

- *rnpt (m)-ḫt zp tpy, IV ꜣḫt sw 10* (in two parts) and *rnpt zp 2*, procession graffiti in Wadi Hîlal (El Kab), although the beginning of the reign of Pepy II is a good possibility,[47] the dates could belong to his predecessor Merenreʿ;
- *rnpt zp 2, III ꜣḫt sw 15*, letter of the king to Harkhuf in his tomb, Aswan;
- *rnpt zp 2*, Sinai graffito no. 17;[48]
- *rnpt zp 11, I šmw sw 23*, the famous letter found in the workshop adjacent to Temple T in the Djoser complex, Saqqara; the reign is inferred from other chronological data of the archives;[49]
- *rnpt (m)-ḫt zp 11, II šmw sw 26*, decree Coptos B, temple of Min;

[42] Dobrev (n. 7).
[43] Dobrev (n. 7), 384–385, pl. 58.
[44] Spalinger, "Texts", 306–307.
[45] Eichler (n. 12), 40, no. 33.
[46] Spalinger, "Texts", 307–308.
[47] H. Vandekerckhove & R. Müller-Wollermann, *Elkab VI. Die Felsinschriften des Wadi Hilâl* (Turnhout, 2001), 210–211, gr. O 144, and 183–186, gr. O 74; conclusions: 375–379.
[48] Eichler (n. 12) 35, no. 17.
[49] P. Posener-Kriéger, "Fragments de papyrus provenant de Saqqarah", *RdE* 32 (1980), 83–93.

- *rnpt zp 12*, graffito of Tômas, either of the two Pepys, but more probably Pepy II;[50]
- *rnpt zp 14, I ꜣḫt sw 23*(?), Hatnub graffito no. 3;[51]
- *rnpt (m)-ḫt 22, IV šmw sw 28* (date in two parts), decree Coptos C;
- *rnpt zp 31, III ꜣḫt sw 3 [+ 3]*, decree for the cult of Mycerinus, Gîza;
- *rnpt zp 31(?), IV prt sw [x]*, graffito from the king's funerary temple, Saqqara;
- *rnpt (m)-ḫt zp 31, I šmw sw 20*, Hatnub graffito no. 7;[52]
- *rnpt zp 33 (?) or 24 (?), IV sw [x]*, decree for the cult of Queen Udjebten, Saqqara.

There are also dates without a king's name which can be placed securely in the second half of Dyn. 6. The first two are from Giza:[53]

- *rnpt zp 2, III prt sw 27*, two mason's marks on the walls of mastaba G 7803C, Giza Eastern Cemetery, and another citing the same year, but month, season and day lost;
- *rnpt (m)-ḫt zp 5*, III *prt sw 29*, two execration texts from Giza. Another date comes from an expedition graffito at Tômas;[54]
- *rnpt 6, III šmw*, probably either Pepy I or II.

Biennial, Irregular or Annual Census? The Case of Dynasty 6

The regularity of the census, backbone of the Ancient Egyptian dating system, is still a matter of controversy for the OK. The most recent discussions of this crucial problem present the largest possible spectrum of interpretations, ranging from a regular biennial census[55] through an annual census with post-census years at irregular intervals[56] to a strictly annual one.[57] That an annual count was already established by Dyn.

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[50] According to Eichler (n. 12), 105 (no. 227A).
[51] Eichler (n. 12), 43, no. 39.
[52] Eichler (n. 12), 44–45, no. 43.
[53] Spalinger, "Texts", 308–309.
[54] Eichler (n. 12), 109, no. 245.
[55] E.g., Baud, "Ménès".
[56] E.g., Verner, "Archaeological Remarks on the 4th and 5th Dynasty Chronology", *Archiv Orientální* 69 (2001), 410–412.
[57] E.g., Kanawati (n. 13).

6 (and not in the FIP, according to the traditional view),[58] is disproved by the number of attestations of *m-ḫt zp* years at this period. Kanawati believes, however, that they resulted from provisional numbering, subsequently altered to "normal 2 years counts". For example, "the reference to the 'year after the sixth count' may simply refer to the seventh year, but before the seventh count was undertaken".[59] This hypothesis ignores the existence of the South Saqqara Stone, with at least two examples of post-census years (one in the reign of Pepy I, and the second under Merenreʿ, see above). Since annals are an official recapitulation of events, there is no reason why the entries should reflect a provisional numbering system.

Kanawati's proposal is an attempt to reconcile apparently contradictory data in the case of Nykau-Izezi (see above), viz., (a) a basilophorous name suggesting that Nykau-Izezi was born under Izezi[60] (b) his representation in the reliefs of the causeway of Wenis, with the high ranking title 'sole friend'; (c) the dating of his burial to the 11th count, presumably of Teti; (d) an estimate of his age at death, based on examination of his remains, as 40–45 years or even slightly younger (35).

Kanawati was influenced by the difficulty of reconciling the relative brevity of Nykau-Izezi's life with the time-span between Djedkareʿ's reign and the 11th census in Teti's reign, presuming a regular biennial census. The 11th census of Teti corresponds to year 22/23 of a regular biennial census system, but at least 13/14, if the census was irregular (since two intervening years are known, 1+ and 6+, see above). Nykau-Izezi was therefore between about 17/18 and 26/27 years old when Teti ascended the throne. Since, on the same premise, Wenis reigned between 16 (*rnpt zp* 8 as highest census) and 9 years,[61] the official was either born at the very end of Djedkareʿ's reign, or ten years earlier. This would account for Izezi in his name, but this explanation is superfluous, since kings were celebrated thus for various reasons, if indeed such names were not simply passed from father to son.[62] Thus the name does not prove that Nykau-Izezi's career began in Djedkareʿ's reign. If he is the like-named official in the Wenis cause-

[58] E.g., Gardiner, "Years", 14–16.

[59] Kanawati (n. 13; 2000a), 21, 23, b; see also Helck (n. 2), 110.

[60] N. Kanawati & M. Abder-Raziq, *The Teti Cemetery at Saqqara V. The Tomb of Hesi* (Warminster: ACE Reports 13, 1999), 37–38, pl. 33, 59.

[61] Verner (n. 56), 410–412, 416.

[62] Another Nykau-Izezi is mentioned, for example, on three graffiti at the pyramid of Pepy I, see V. Dobrev, "Les marques sur pierres de construction de la nécropole de Pépi Ier. Étude prosopographique", *BIFAO* 96 (1996), 112, D.1.

way reliefs, he was promoted to 'sole friend' between the ages of 17 and 27—quite young in either case. The first alternative may indeed seem much too young, but high-ranking titles may not have been confined to mature officials. All in all, there are simply too many uncertainties in Kanawati's argument. The same situation obtains for other officials who started their careers under Teti and died under Merenreʿ. Some cases may still be debatable, as Kanawati rightly pointed out.[63] Weni, for example, already held a relatively high position under Teti and must have been about 70 when Merenreʿ ascended the throne, since Pepy I's reign amounts to 50 years, presuming a strictly biennial system. This seems very old for the onerous duties reported in his biography, and for his journeys to obtain materials and monuments for the king's tomb. However, this may have been a conceit to celebrate the official's longevity and his capacity to remain active at an advanced age.

If the theory of an annual census be discarded for sound reasons, it must nevertheless be admitted that no basis exists for deciding in favour of either of the alternatives, the regular or irregular biennial system. On the one hand, the number of attested census years is very well balanced by post-census years during the reigns of Teti to Pepy I. When the sources shed some light on a segment of these reigns, i.e. the earliest counts of Teti (1 to 2), the latest counts of Pepy I (18 to 25) and the earliest and latest counts of Merenreʿ (1 and 5), the number of intervening years equals, or nearly equals, the number of census years. The alleged total imbalance between the two[64] results from the limited number of sources and prejudice associated with the category of sources, as exemplified by the masons' marks of Dyn. 4 at Giza.[65] On the other hand, the extreme imbalance for the reign of Pepy II could favour an irregular counting system in his particular case. The celebrated longevity of the king in tradition[66] as well as the fact that he was a child at his accession,[67] demand reconciliation with the contemporaneous record, to which a biennial count does justice.[68] The table below summarizes the dates for the period from Teti to Pepy II:

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[63] Kanawati (n. 13, 2000a), 22–23.

[64] E.g., Helck (n. 2), 106–110; Spalinger, "Texts", 314–316.

[65] Baud, "Ménès", 119–121.

[66] Baud, "Ménès", 129, with caution.

[67] K. Ryholt, "The Late Old Kingdom in the Turin King-list and the Identity of Nitocris", *ZÄS* 127 (2000), 87–100, at 94.

[68] H. Goedicke, "The Death of Pepy II-Neferkare", *SAK* 15 (1988), 111–121; Beckerath, *Chronologie*, 151–152.

King	Highest Census	Minimal Number of Post-census	Minimal Reign Length A Years	Minimal Reign Length B
Teti	11	2	13 years	22/23 years
Userkareʿ	?	?	[2/4]	[2/4]
Pepy I	25(+?)	2 or 3	27	50/51
Merenreʿ	5+	2	7	11/12
Pepy II	31, ev. 33	3 or 4	34	62/63
Total	min. 83	9/10	83/85	147/153

X+ indicates a post-census year, for which X is the number of counts; "minimal reign length A" is the sum of the highest count (col. 2) and the attested intervening years (col. 3);[69] "minimal reign length B" presupposes a regular biennial census; the estimate for Userkareʿ is based on the royal annals (see above).

Dynasty 8

The identity, number and order of the Memphite rulers of Dyn. 8 remain uncertain and identifications rely heavily on the much later Ramesside lists.[70] The *TC* counts 8 rulers after Pepy II (col. iv, no. 5 to 13, this name and some others in lacuna).[71] It includes, in second position, Queen Nitocris, who turns out to be a male ruler, Neitiqerty Siptah, according to Ryholt's recent examination of the papyrus.[72] The Abydos list (nos. 39 to 56) adds 10 more rulers, all probably between Neitiqerty (Abydos no. 40, if identified with Netjerkareʿ) and Neferka Khered-seneb (Abydos no. 51, called Neferkareʿ Pepy-seneb),[73] a group which may have been in lacuna in the *TC Vorlage* and therefore probably reported as *wsf*/lost.[74]

[69] After Verner (n. 56), 415–416.
[70] E.g., Beckerath, *Chronologie*, 151–152.
[71] This column should be renumbered 5, since according to Ryholt's recent study (see n. 67) there is evidence of an intermediate column between col. I and II of Gardiner's edition.
[72] Ryholt (n. 67), 87–100.
[73] See Ryholt (n. 67), 87–94.
[74] Beckerath, *Chronologie*, 148–9; Ryholt (n. 67), 96–98.

According to the partially preserved figures in the *TC*, both for reign lengths and summations of grouped dynasties, Dyn. 8 covered a very short period of about one generation. However, not only is the reading of some of the figures problematic (e.g., the total for Merenreʿ),[75] but the very value of the figures remains largely questionable, as exemplified by contradictory OK data for a number of reigns. Recent analysis would double the duration of this dynasty, to at least 50 years,[76] or even slightly more,[77] but this is not a significant change in the image of a relatively short and obscure period. In this particular case, the *TC* data is probably not far from the truth with its low figures for individual reigns: 1 year for the immediate successor of Pepy II (name lost, no. 6) and between 1 1/2 to 4 years for the last four rulers (nos. 10–13). The six *wsf*-years reported in the subtotals (col. iv, 14–17) for ten missing kings probably represent an artificial emendation of the scribe, as exemplified by other occurrences of this figure.[78] All in all, these brief reigns accord with the few royal monuments recovered so far, and the low figures of the preserved dates.[79] Arranged in increasing numeric order, they are:

- *rnpt zmꜣ-tꜣwy, II prt sw 20*, Coptos decree P of [Netjeri-bau] (Horus name of Neferkauhor; identification from parallel decrees),[80] temple of Min;[81]
- *rnpt zp zmꜣ-tꜣwy, IV šmw 1 (wpty)*, decree of [Demedj-ib]-tawy (?), (Horus name),[82] funerary complex of Queen Neith, Saqqara;

[75] For the old reading '44 years', see Ryholt (n. 67), 90, 98.

[76] Beckerath, *Chronologie*, 151–152.

[77] S. Seidlmayer, "Zwei Anmerkungen zur Dynastie der Herakleopoliten", *GM* 157 (1997), 84–85.

[78] Ryholt (n. 67), 97–98.

[79] Spalinger, "Texts", 312–313.—Note also the inscription Cairo JE 43290 dated to *rnpt zp <1 ?>; IV ꜣḫt 25.* The numeral is omitted, but 1 is the most likely emendation, see H. Goedicke, "A Cult Inventory of the Eighth Dynasty from Coptos (Cairo JE 43290)", *MDAIK* 50 (1994), 72. This could refer to the first incomplete civil year—year 0—usually designated *zmꜣ-tꜣwy*. The inscription presumably originates from Coptos or nearby Khozam. Goedicke (ibidem) ascribed it tentatively to Nefer-kau-hor, but Fischer, in: Manuelian, ed., *Studies Simpson*, 267–270, argues for a date towards the end of Herakleopolitan rule in the Coptite nome. See also below Krauss, chapter III. 8 for the Khozam lunar date.

[80] See W. C. Hayes, "Royal Decrees from the Temple of Min at Coptos", *JEA* 32 (1946), 3–23.

[81] Goedicke, *Dokumente*, 195–196, with Hayes (n. 80), pl. V.

[82] According to the restoration proposed by Schenkel, *Memphis*, 24–25.

- *rnpt zp tpy, IV ꜣḫt sw 2*, Wadi Hammamat inscription of King Ity (mentioned in the name of his presumed pyramid),[83] possibly Dyn. 8 (O.Ham no. 169);
- *rnpt zp tpy (?), III šmw sw 2*, Wadi Hammamat inscription of an unknown king, date uncertain but possibly Dyn. 8 (O.Ham no. 152);[84]
- *[rnpt] zp 4 [+ x?]*,[85] season etc. lost, Coptos decree H of king Kha[bau?] (Horus name).[86]

The absence of post-census years probably testifies to a change in the dating system from a regular (?) biennial to an annual one.[87]

[83] Tentatively equated with Neferirkareʿ II of the Abydos list and the contemporary Horus Demedjibtawy by Spalinger, "Texts", 313, and n. 104. Goedicke's reading (n. 35), 66–67, (*rnpt zp tpy <jb-sd>* taken to refer to Pepy I is not supported by the parallel evidence.

[84] See Schenkel, *Memphis*, 32–33; Goedicke (n. 79), 83.

[85] The stela is lost below the four aligned strokes. While 3 or even 4 more strokes could possibly have figured in a lower line, it is rather unlikely in such a period of ephemeral kings.

[86] Goedicke, *Dokumente*, 163–164, fig. 16 and 23; for the date: Hayes (n. 80), 13, n. 7, and pl. iiia, top, before col. 1.

[87] Gardiner, "Years", 14–16; Hayes (n. 80), 13; Spalinger, "Texts", 312.

II. 6 THE RELATIVE CHRONOLOGY OF THE FIRST INTERMEDIATE PERIOD

Stephan J. Seidlmayer

In dynastic history,[1] the FIP spans the era of Herakleopolitan rule (Dyns. 9 and 10) and the earlier part of the Theban Dyn. 11 up to the re-unification of the country which occurred at some point in the reign of Nebhepetreʿ Mentuhotpe II. When we attempt to clarify the dynastic structure of this period and to estimate its chronological length, our argument will be more straightforward if we first deal with Dyn. 11 and only then turn our attention to the problems of the Herakleopolitan dynasties.

Dyn. 11

We are comparatively well informed about Dyn. 11.[2] While the king lists of Abydos and Saqqara omitted all FIP rulers and listed only Nebhepetreʿ Mentuhotpe II and Sʿankhkareʿ Mentuhotpe III of Dyn. 11,[3] the *TC* gives a full account of its rulers, omitting only (as do the lists of Abydos and Saqqara) its last ruler Nebtawyreʿ Mentuhotpe IV, whose reign was relegated to a group of "missing" (*wsf*) years.[4] While the names of most of the kings are destroyed in the *TC*, a number of reign length data are preserved. Most valuable, however, is the fact that this document also provides a figure for the total length of the dynasty which allows us to determine the combined length of the first two reigns, for which individual length data are not preserved. The royal names which are destroyed in the *TC* can easily be reconstructed.

[1] To define the FIP as a distinctive phase in the history of pharaonic culture or its political structure, one would envisage a more extensive period including at least the end of the OK after the demise of Pepy II.

[2] For accounts of the chronology of Dyn. 11 see Schenkel, *Studien*, 145–149; Gestermann, *Kontinuität*, 22–31; Beckerath, *Chronologie*, 139–142.

[3] Abydos list nos. 57–58, Saqqara list nos. 37–38.

[4] *TC* V, 11–18.

The list of royal ancestors inscribed by Tuthmosis III in the temple of Karnak[5] and a relief block from the temple of Tod which lists the predecessors of king Mentuhotpe II are particularly relevant.[6] Biographical inscriptions of officials also attest the names and sequence of the more important rulers,[7] while dated monuments and inscriptions concur to confirm the accuracy of the reign length data of the *TC*.[8] Confusion about the number of rulers named Mentuhotpe, caused by the fact that Nebhepetreꜥ Mentuhotpe II changed his protocol twice, were settled by Gardiner.[9] On this basis, the data relating to the sequence and length of reigns of Dyn. 11 can be summarized with some confidence as follows:

TC	Years	Karnak	*Urk.* IV	Tod	Modern
		jrj-pꜥt [ḥꜣtj-ꜥ] Jnj-[jtj.f]	608.15		count Inyotef
[Mnṯw-ḥtp]	16	*Ḥrw tpj-ꜥ Mn[ṯw-ḥtp]*	608.14		Mentuhotpe I
[Jnj-jtj.f]		*Ḥrw [S]h[r-tꜣ.wj] Jnj-[jtj.f]*	608.13	*Ḥrw Shr-tꜣwj Jnj-jtj.f*	Inyotef I
[J]n[j-jtj.f]	49	*Ḥrw [Wꜣḥ-ꜥnḫ] Jnj-jtj.f*	608.12	*Ḥrw Wꜣḥ-ꜥnḫ Jnj-jtj.f*	Inyotef II
[Jnj-jtj.f]	8	*[Ḥrw Nḫt-nb-tp-nfr Jnj-jtj.f]*	608.11	*[Ḥrw Nḫt-nb-tp nfr] Jnj-jtj.f*	Inyotef III
Nb-ḥpt-Rꜥ	51	*Nb-ḥpt-Rꜥ*	609.14		Mentuhotpe II
Sꜥnḫ-kꜣ-Rꜥ	12	*Sꜥnḫ-kꜣ-Rꜥ*	609.15		Mentuhotpe III
wsf	7	*[Nb-]tꜣ[.wj]-Rꜥ*	609.16		Mentuhotpe IV
Total	143				

[5] *Urk.* IV, 608–609.

[6] J. Vandier, "Un nouvel roi Antef de la XI[e] dynastie", *BIFAO* 36 (1936), 101–116.

[7] The sequence Inyotef II, Inyotef III, Mentuhotpe II is attested in three biographical inscriptions from Thebes, see Clère & Vandier, *Textes*, 15–16 § 20, and 19–20 § 23–24.

[8] For Inyotef II a regnal year 50, probably the year of his burial, is attested on a stela from his tomb, Clère & Vandier, *Textes*, 11 § 16; no dated monuments are known for Inyotef III; for Mentuhotpe II, stela Turin 1447 (Schenkel, *Memphis*, 240) attests year 46; for Mentuhotpe III a rock inscription in Wadi Hammamat attests year 8 (Schenkel, *Memphis*, 253 no. 426), and for Mentuhotpe IV a series of graffiti at the same place, year 2 (Schenkel, *Memphis*, 263–268, nos. 441–444).

[9] A. H. Gardiner, "The First King Menthotpe of the Eleventh Dynasty", *MDAIK* 14 (1956), 42–51; see also L. Habachi, "King Nebhepetre Menthuhotep: his monuments, place in history, deification and unusual representations in the form of gods", *MDAIK* 19 (1963), 16–52.

A number of comments are in order. "Count" Inyotef, who was prefixed as a non-royal ancestor to the line of Dyn. 11 kings in the Karnak inscriptions, is in all probability identical with the *jrj-pʿ.t ḥȝ.tj-ʿ Jnj-jtj.f ms Jkwj* to whom Senwosret I dedicated a votive statue in this temple.[10] Whether he can also be identified with one of the attested pre-11th dynasty nomarchs of this name,[11] cannot be strictly demonstrated. The lacunary state of the evidence available would seem to recommend a careful stance in such matters. In any case, this question has no direct consequences for the chronology of the period.

The Horus name *tpj-ʿ* "the ancestor" accorded the first king of the dynasty is evidently a later fiction intended to prolong the royal line into the past. No contemporary monuments are attested for this person; however, a statue erected by Inyotef II at Elephantine calls him "father of the gods", i.e. the father of the first two kings of Dyn. 11.[12] Nor is his direct successor, Sehertawy Inyotef I ever attested in contemporary inscriptions.[13] However, the sequence of tombs in the royal necropolis at el-Tarif suggests that the Saff Dawaba belonged to this ruler. The truly extraordinary size and layout of this tomb substantiate his claim to royal status.

All other kings of the dynasty are well documented in contemporary sources. Of some interest is the fact that the last ruler, Nebtawyreʿ Mentuhotpe IV, attested in rock inscriptions from his second regnal year in Wadi Hammamat,[14] was omitted from all of the NK kings lists. The reason is speculative, but it does not seem very far fetched to suppose that his absence was motivated in some way by the circumstances of the transfer of power to a new royal house. In view of the lack of sufficient evidence it remains uncertain whether all 7 "missing"-years in the *TC* belonged to him or whether there was a period of disputed rule at the end of the dynasty,[15] for which, however, there is no positive evidence.

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[10] Cairo *CG* 42005.

[11] See the discussion in Gestermann, *Kontinuität*, 24–26, and F. Gomaa, *Ägypten während der Ersten Zwischenzeit* (Wiesbaden: TAVO B27, 1980), 138–144.

[12] On this king see L. Habachi, "God's fathers and the role they played in the history of the First Intermediate Period", *ASAE* 55 (1958), 167–190.

[13] W. Schenkel in: D. Arnold, *Gräber des Alten und Mittleren Reiches in El-Târif* (Mainz: AV 17, 1976), 50.

[14] Schenkel, *Memphis*, 263–268 nos. 441–444.

[15] J.v. Beckerath, "Zur Begründung der 12. Dynastie durch Ammenemes I.", *ZÄS* 92 (1965), 8–9.

While none of the Manethonian sources lists individual kings, all of them claim that Dyn. 11 comprised 16 kings who ruled for 43 years. Evidently, the number of kings was inflated by 10 from 6 to 16, while the number of years was reduced by 100 from 143 to 43. Nevertheless the basic similarity of the figures again shows how close Manetho's data are to earlier pharaonic tradition.

Unfortunately, the date of the re-unification of Egypt cannot be determined precisely within the reign of Nebhepetreʿ Mentuhotpe II.[16] A stela of one Inyotef from Thebes is dated to year 14 of Mentuhotpe II, "the year of the rebellion of Thinis".[17] This event is in all probability to be seen in the context of the war between Thebans and Herakleopolitans, which was fought, at least in its earlier phases, in the Abydos-Asyut region. An inscription of an official who governed the Heliopolitan nome, dated to year 41 of Mentuhotpe II, provides proof that by then Mentuhotpe II controlled all of Egypt.[18]

Information which could clarify the sequence of historical events in the period between these two dates is lacking. The phases and modalities of Mentuhotpe II's conquest of the Herakleopolitan kingdom, as well as the development of his political aspirations and his propaganda, remain unknown. Nevertheless it seems likely that both the actual course of political events and the ideological dimension of the war between Thebans and Herakleopolitans did have some influence on how the end of the Herakleopolitan dynasty was chronologically fixed in later annalistic tradition. Therefore one should be well aware that not only the *date* of the historical event of the re-unification of Egypt is lacking from our documentation but that the historical process *itself* in its substance eludes us.

It is even more difficult to use indirect criteria in an attempt to fix the date of the re-unification of Egypt. The two alterations of Mentuhotpe II's royal protocol[19] may be linked to the stages of his rule over Egypt. In particular his latest Horus name *zmꜣ-tꜣ.wj* "uniter of the two lands", attested for the first time in regnal year 39,[20] invited direct historical

[16] On this issue see Franke, "Chronologie I", 133, and Gestermann, *Kontinuität*, 35–42, with further literature.

[17] Clère & Vandier, *Textes*, 19 § 23; Schenkel, *Memphis*, 227.

[18] Gestermann, *Kontinuität*, 42 n. 5.

[19] Beckerath, *Handbuch*, 78–79.

[20] Inscriptions in Wadi Schatt el-Rigâl, Schenkel, *Memphis*, 207–208 no. 318 and 320. Beckerath's doubts that the date belongs to the rock inscription of Mentuhotpe II (*Chronologie*, 141 with n. 632) are in no way convincing.

interpretation. However, as Gestermann rightly pointed out, this is not at all certain and in fact all his Horus names imply a claim of dominance over the whole of Egypt.[21] Rather more significant seems to be the development of the structure of the royal protocol. While in the first stage, Mentuhotpe, like his Theban FIP predecessors, used only a Horus name and the titles *nswt-bjt* and *z3-Rᶜ* with personal name, he introduced in the second stage both a *nb.tj*-name and the throne name Nebhepetreᶜ, thus claiming full royal status.[22] Whether this move reflected only his aspirations or his actual taking over of power remains unknown, however. In addition, from a strictly chronological point of view, this discussion is bound to remain more or less fruitless, since we do not know when the changes in the royal protocol occurred. Speculating that the earlier, rather than the later change of the protocol might be linked to the end of Herakleopolitan rule over northern Egypt would only intuitively make it more likely that Mentuhotpe's victory had occurred in the earlier part of his reign. Strictly speaking, however, an uncertainty of about 25 years in fixing the date of the re-unification of Egypt remains until new sources become available.

The Herakleopolitan Dyns. 9 and 10

Determining the identity and length of Herakleopolitan rule is much more difficult.[23] Manetho's account listed two dynasties of rulers from Herakleopolis,[24] Dyn. 9 with four (Eusebius) or 19 kings (Africanus) who ruled for 100 (Eusebius) or 409 years (Africanus), and Dyn. 10 with 19 kings who ruled for 185 years according to all sources. The *TC*, in contrast, listed only a single dynasty of 18 rulers;[25] unfortunately nearly all of the royal names and all reign length data as well as the total for this dynasty, which originally was given in line V.10, are lost.

[21] Gestermann, *Kontinuität*, 35–39.
[22] This view was envisaged already by Hayes and Arnold, see Gestermann, *Kontinuität*, 37, n. 2–3.
[23] See J.v. Beckerath, "The Date of the End of the Old Kingdom in Egypt", *JNES* 21 (1962), 140–147; idem, "Die Dynastie der Herakleopoliten (9./10.)", *ZÄS* 93 (1969), 13–20; H. Goedicke, "Probleme der Herakleopolitenzeit", *MDAIK* 24 (1969), 136–143; Beckerath, *Chronologie*, 143–145; S. J. Seidlmayer, "Zwei Anmerkungen zur Dynastie der Herakleopoliten", *GM* 157 (1997), 81–90, with additional literature.
[24] Waddell, *Manetho*, 60–63.
[25] *TC* IV.18–V.10.

The king lists of Abydos and Saqqara omitted the period of Herakleopolitan rule completely.

While following the authority of the more ancient king list the unity of the Herakleopolitan dynasty was already assumed by Schenkel and others,[26] Malek was able to account convincingly for the discrepancy between the *TC* and Manetho. He demonstrated that the first four kings of the dynasty came to be separated from the main group of kings as a result of a series of misunderstandings which occurred when the original text was copied.[27] The number of 19 kings which Manetho gives for Dyn. 10 and which Africanus duplicated also for Dyn. 9 accurately reflects the total number of kings as given for the Herakleopolitan dynasty in *TC* V.10. The difference of one king between *TC* and Manetho can very likely be explained by suggesting that the *TC* omitted the last Herakleopolitan ruler, just as the last king of Dyn. 11 was omitted, probably because he was not considered legitimate, having been removed from power under shameful circumstances as a result of the victory of the Thebans over the Herakleopolitan kingdom.[28] According to this analysis which interprets the separation of Dyns. 9 and 10 merely as a result of textual corruption in post NK tradition, the terms "Dyn. 9" and "Dyn. 10" should, for the sake of terminological precision, no longer be used in historical interpretation to designate an earlier and a later phase of Herakleopolitan rule.[29] This argument has, of course, no implications whatsoever for the length and historical structure of the period.

Since the relevant entries are destroyed in *TC*, and since only very few contemporary monuments of the Herakleopolitan kings are preserved, the names and the sequence of the 19 Herakleopolitan kings cannot be reconstructed coherently.[30] Manetho names a king Khety as the founder of the dynasty, and the fact that the Herakleopolitan kingdom was referred to as *pr Ḫty* "the house of Khety" in contemporary

[26] Schenkel, *Studien*, 149–150; Beckerath, "Herakleopoliten" (n. 23).

[27] J. Malek, "The Original Version of the Royal Canon of Turin", *JEA* 68 (1982), 105; Redford, *King-Lists*, 238–239, arrives at an equivalent conclusion, though with different arguments.

[28] For another solution see Malek, "Version" (n. 27), 105.

[29] Seidlmayer, "Anmerkungen" (n. 23), 85–86.

[30] For the available data see Beckerath, *Handbuch*, 72–75; to the material listed there add M. Abd el-Gelil, A. Saadani & D. Raue, "Some Inscriptions and Reliefs from Matariya", *MDAIK* 52 (1996), 146–147.

sources[31] lends credibility to this tradition. For the third ruler, the name *Nfr-kꜣ-Rꜥ* is preserved in *TC*. He could be identical with King *Nfr-kꜣ-Rꜥ* whose name appears (with a graphic transposition *kꜣ-nfr-Rꜥ*, typical for the Herakleopolitan period)[32] on a label in the tomb of ꜥAnkhtifi at Moalla.[33] The last ruler of the dynasty was probably Merykareꜥ, whose name appears in texts relating to the final phase of the Theban-Herakleopolitan war in Siut tomb IV[34] and whose pyramid complex at Saqqara is attested in the titles of funerary priests.[35] In fact, the general tenor of the "Teachings for king Merykareꜥ" seems to suggest that this king suffered defeat by the Thebans.

Determining the length of the Herakleopolitan period is fraught with all but unsurmountable difficulties. Data for the length of individual reigns or of the entire dynasty are not preserved. Since it is clear, however, that the Herakleopolitan dynasty did not start *after* Dyn. 11 but ran parallel to it up to the re-unification of Egypt under Nebhepetreꜥ Mentuhotpe II, it must have lasted for between 87 and 114 years *at least*, depending on the exact date of the re-unification. Dismissing the data given by Manetho as unreliable, Beckerath developed the hypothesis of an ultra-short Herakleopolitan period making the beginning of Dyn. 11 more or less coeval with the establishment of the new Herakleopolitan line of rulers in the north.[36] Apart from speculations about the historical development, this hypothesis rests mainly on the fact that so very few monuments are attested for the Herakleopolitan period, implying a short duration. This argument, however, is clearly not valid, since the 100 years or so when the Herakleopolitan dynasty existed parallel to the Theban kingdom did not leave many traces in the monumental record either. Evidently, this situation is due to the bias of

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[31] E.g. the stela of Djari, Clère & Vandier, *Textes*, 14 § 18, l. 3; see also O. D. Berlev, "The Eleventh Dynasty in the Dynastic History of Egypt", in: D. W. Young, ed., *Studies presented to Hans Jakob Polotsky* (East Gloucester/Mass., 1981), 361–377.

[32] Schenkel, *Studien*, 150; D. B. Spanel, "The Date of Ankhtifi of Moꜥalla", *GM* 78 (1984), 89.

[33] J. Vandier, *Moꜥalla* (Cairo: BdE 18, 1950), 36.

[34] Schenkel, *Memphis*, 86 No. 64.

[35] *PM* (2) III, 562–563; J. Malek, "King Merykare and his Pyramid", in: C. Berger, G. Clerc & N. Grimal, eds., *Hommages à Jean Leclant IV* (Cairo: BdE 106.4, 1994), 203–214; Kh. A. Daoud, "The Herakleopolitan Stelae from the Memphite Necropolis", in: Eyre, *Proceedings*, 303–308.

[36] Beckerath, "Herakleopoliten" (n. 23); for the details of the discussion see Seidlmayer, "Anmerkungen" (n. 23), 82–83.

our sources, which tend to favour UE, and to the special character of FIP kingship which was no longer able to muster the resources of the country to construct monumental buildings. The argument that the Herakleopolitan kings were dropped from the Abydos king list and therefore never ruled UE does not carry much weight either. Even if the Herakleopolitan dynasty never wielded *effective* rule over UE, it could nevertheless have held *nominal* supremacy over the whole country for a period of time. The fact that a Herakleopolitan ruler was mentioned in the tomb of ʿAnkhtifi and that a certain Setka in his still unpublished biographical inscription in his tomb on Qubbet el-Hawa claimes to have entertained peaceful trade relations with the "House of Khety" seem to provide direct proof that there was indeed a period of Herakleopolitan sole rule before the advent of Dyn. 11 at Thebes.

The only source which could provide data on the length of this period is the account of Manetho which has to be used with extreme caution, however. As was argued elsewhere,[37] Manetho's data for the length of Dyn. 9 can be dismissed since these numbers clearly could have been created only after the artificial division of the dynasties had occurred in post NK textual tradition. The information on the length of Dyn. 10, however, derives from a year total which was present already in earlier annalistic tradition and therefore could be of real historical value. Taking Manetho's figure at face value, the period of Herakleopolitan rule before the start of Dyn. 11 would amount to something between 71 and 98 years, again depending on the date of the re-unification of the country. Of course, there is no way to be sure about the correctness of Manetho's figure; if one chooses to disregard Manetho's data, however, the length of the Herakleopolitan dynasty becomes entirely a matter of speculation, since there are no other sources available for fixing the length of Herakleopolitan rule before Dyn. 11. Nevertheless a number of excellent scholars have tried, hypothetically linking the prosopographical and historical data which can be derived from tomb inscriptions from UE, to reach a reconstruction of the historical events of the earlier part of the FIP which would provide the basis for a tentative estimate of its length.[38] It should be not overlooked, however, how very problematic this type of reasoning is

[37] For details see Seidlmayer, "Bemerkungen" (n. 23), 86–88.

[38] An intermediate estimate between Beckerath's minimum solution and the Manethonian maximum model was proposed e.g. by Fischer, *Dendera*, 131 n. 579.

bound to remain and how very unlikely it is that the dispersed pieces of fragmentary evidence which were preserved by mere chance could indeed link up to form a historically coherent picture.

The customary "short model" and the Manethonian "long model" result in two profoundly different views about the FIP. Therefore a look at the documentation for the period beyond the material relating to dynastic history in the strict sense could provide indications whether a short or a long model is more likely. Basing the argument solely on material from the royal sphere, as is often done in discussions of dynastic chronology, leads inevitably to a foreshortened perspective for periods of weak kingship. The extensive prosopographic data from the FIP led Brovarski and Spanel to conclude that a succession of several generations of local administrators held office in many UE towns between the end of the OK and the beginning of Dyn. 11,[39] thus clearly favouring a long model for the period in perfect accord with the data of Manetho. Also, the archaeological record can be made to bear on the problem. As was argued by Ward and Seidlmayer, the large number of burials in Upper Egyptian cemeteries which are to be dated to the earlier part of the FIP, as well as the fundamental morphological change which can be discerned in the archaeological material exactly in this phase, argue for a period of several generations.[40] Therefore, substantial evidence seems to support Manetho's figure for the length of the Herakleopolitan period. Nevertheless, the chronology remains on shaky ground. Since the discovery of new historical sources cannot be predicted (although the excavations at the site of Herakleopolis Magna could certainly turn up new evidence), and since the potential of radiocarbon dating for this period seems to be limited, current efforts to establish a dendrochronological series which covers the second millennium BC might offer the prospect of substantial progress.[41]

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[39] E. Brovarski, "The Inscribed Material of the First Intermediate Period from Naga-ed-Dêr", *AJA* 89 (1985), 581–583; idem, *The Inscribed Material of the First Intermediate Period from Naga-ed-Dêr* (Diss. Chicago, 1989) I, 15–53; D. B. Spanel, "The Date of Ankhtifi of Mo'alla", in *GM* 78 (1984), 87–94; idem, *Beni Hasan in the Herakleopolitan Period* (Diss. Toronto, 1984).

[40] W. A. Ward, *Egypt and the East Mediterranean World 2200–1900 BC* (Beirut, 1971), 10–11; S. J. Seidlmayer, *Gräberfelder aus dem Übergang vom Alten zum Mittleren Reich* (Heidelberg: SAGA 1, 1990), 378; idem, "Anmerkungen" (n. 23), 84.

[41] See below Cichocki, chapter III. 3, with additional literature.

II. 7 THE RELATIVE CHRONOLOGY OF THE MIDDLE KINGDOM AND THE HYKSOS PERIOD (DYNS. 12–17)

Thomas Schneider

1. *Terminology and Methodology*

Substantial progress has been made in the study of the relative Chronology of the MK and Hyksos Period (MK/SIP)[1] since the presentation of the state of our knowledge fifteen years ago by D. Franke[2] thanks to new discoveries and the reappraisal of core issues. Moreover, there have been impulses to improve the terminological precision—particularly due to K. S. B. Ryholt's reassignment of dynasty designations—that are basically desirable.

Ryholt[3] has reassigned the term "Dyn. 16", which had traditionally been used to designate vassals of the Dyn. 15 Hyksos, although it was known that this was based on an erroneous reading of the Manethonian tradition,[4] to a sequence of Theban rulers which would have been listed in *TC* X, 31–XI,14 and which he identifies as a "First Theban Dynasty".[5] While the term "Dyn. 17" is generally understood as referring to all of the Theban rulers between Dyns. 13 and 18 who were believed to be listed in *TC* X, 31–XI, 14, this term is used by Ryholt only for a

[1] The designation of the period is a historiographical, rather than a chronological, concern. Cf. Franke, "Chronologie II", 245–274, esp. 245f.; idem, *Heqaib*, 77–78; Schneider, *Ausländer*, 155–156; differently, Ryholt, *Situation*, 311. For the present chapter, I prefer the title "MK and Hyksos Period", as Ryholt's use of "Intermediate Period" is based on the alleged political division of Egypt since the end of Dyn. 12, which is not necessarily valid (cf. below) whereas our term corresponds to the period. I would like to thank M. Bietak, D. Franke, E. Hornung, D. Polz and A. Spalinger who read and commented upon earlier drafts of the text. Bibliography has been considered until spring 2002 when the manuscript was delivered.

[2] Franke, "Chronologie I. II."

[3] Ryholt, *Situation*. Reviews: D. Ben-Tor, S. Allen, J. P. Allen, "Seals and Kings", *BASOR* 315 (1999), 47–74; R. Holton Pierce, *Acta Orientalia* 60 (1999), 207–213; J. v. Beckerath, *AfO* 46/47 (1999/2000), 433–435; W. Grajetzki, *OLZ* 95(2000), 149–156; A. Dodson, *BiOr* 57(2000), 48–52; A.S. Spalinger, *JNES* 60 (2001), 296–300.

[4] Beckerath, *Untersuchungen*, 17–20, Schneider, *Ausländer*, 123.

[5] Ryholt, *Situation*, 151.

chronologically later group of Theban kings, his “The Second Theban Dynasty”. The rulers of Near Eastern origin, but not members of Dyn. 15, are then designated as “Dyn. 14”.[6]

In a response, Beckerath has suggested that the entire sequence of Theban kings between Dyn. 13 and 18 should henceforth be termed “Dyn. 16”, and to use the term “Dyn. 17” for the rival dynasty at Abydos postulated by Ryholt.[7] Depending upon the course and outcome of the discussion (for details, cf. below section 4) it might be useful to maintain “Dyn. 17” for the (larger number of) Theban kings.

In order to avoid the menace of conceptual confusion, this contribution will distinguish the different terminologies by adding the exponents “T” (for *traditional*) and “R” (for *Ryholt*) to positions of kings where these vary in the chronological reconstruction. Furthermore, alternative dynasties differing from the customary usage will be put in quotation marks, e.g. Dyn. 16 signifies the conventional Dyn. 16, whereas “Dyn. 16” refers to the terminological reassignment by Ryholt or later. The numbering of the columns in the *TC* follows Gardiner’s standard publications whereas different systems of numbering are explicitly stated (“Ryholt’s ninth column”).

Methodologically, it is important to note that a chronological framework for the period can be established that extends from Dyn. 12 to Dyn. 13 where it can be roughly fitted into Dyns. 15 and 17 (or “Dyns. 16/17” according to Ryholt). In its original state, the *TC* recorded at least 50 kings for Dyn. 14, for whom, however, the length of the reign is preserved for only a few, and only two (ʿꜣ-sḥ-rʿ Nḥsj; Mrj-ḏfꜣ-rʾ) are otherwise attested through monuments. The rulers known from scarabs are not among those listed in the entries for Dyn. 14 in the *TC*. Ryholt’s attempt to create a typological sequence of scarabs upon which to build chronologically acceptable successions has encountered considerable criticism.[8] As other hypotheses are likewise difficult to support (an overlap of early Dyn. 14 and the end of Dyn. 12;[9] the relationship between Dyns. 13 and 14 in the sense of a “trade agreement”),[10] Dyn. 14

[6] Ryholt, *Situation*, 94ff.
[7] Cf. below, section 4. A decision depends largely upon the interpretation of *TC* XI.
[8] Ben-Tor et al. (n. 3), 53–65.
[9] Ben-Tor et al. (n. 3), 55, 59, 66.
[10] Ben-Tor et al. (n. 3), 59f.; Spalinger (n. 3), 299; more positive, Beckerath (n. 3), 434; Grajetzki (n. 3), 153–154 (who does point out that of 600 seals from Dyn. 14, only one was found in Ryholt’s postulated capital of Dyn. 14, Avaris/Tell el-Daba).

disappears as an alternative to Dyn. 13 as a chronological link between the MK and Dyns. 15 and 17 ("Dyns. 16/17" according to Ryholt). Ryholt weeds out a number of fragments of *TC* col. X which allegedly record fictitious royal names, and places them in a postulated additional column of gods and demigods at the start of the papyrus (new second column) with the result that the numbering of the columns would increase by one for all following columns.[11]

2. *Dynastie 12*

The more recent chronological discussion on Dyn. 12 has been dominated by the issue of coregencies, whereas the succession of rulers and their reign-lengths are in principle resolved.[12] After Franke in his survey in 1988 assumed the validity of the coregencies of Dyn. 12,[13] C. Obsomer has not only rejected the alleged 10-year coregency of Amenemhet I and Senwosret I, but all other coregencies of Dyn. 12 as well, in the extensive discussion of the problem in his study of the reign of Senwosret I (as R. D. Delia and W. Helck before him).[14] Delia remarked about this: "Obsomer's reconstruction largely rests upon an all-or-nothing foundation. If one is unconvinced that Obsomer has satisfactorily explained away all of the coregency evidence, then much of

[11] Ryholt, *Situation*, 24–25. In some responses to Ryholt's work, the elimination of the allegedly fictitious names of the *TC* have been met with enthusiastic agreement: Ben-Tor et al. (n. 3), 315, 49; Beckerath (n. 3), 433; idem, *Handbuch,* 282; Dodson (n. 3), 49. Note however, that Ryholt's proposal (*Situation*, 24 n. 59) takes part of its legitimation from considering Redford's efforts to recognize West Semitic names in the notations a failure. A modified version of the approach has been offered by Schneider, *Ausländer*, 99–122; the doubts mentioned there (100) on the reorganization of the fragments have not been eliminated. There is also the question whether names such as "Protector of noble women" etc. would be more plausible among the mythical demigods. Note also that Ryholt moves fr. 42 with the divine name "Apis" whereas fr. 123 with the same name "Apis", followed by two entries written in group writing, is left in the section of the SIP. Fr. 22 which Ryholt also shifts might preserve the name of a ruler known from scarabs, *ʿnt-hr* (Schneider, *Ausländer*, 134), and fr. 152 another king known from scarabs, *Pns* (Schneider, *Ausländer*, 106–109, 140).

[12] An absolute chronological date in the early 12th dynasty could perhaps be provided by the astronomical reference of Sesostris's temple at Karnak, cf. L. Gabolde, *Le „Grand Chateau d'Amon de Sesostris Ier à Karnak"* (Paris, 1998), 123–134; but see below Belmonte, Chapter III. 5.

[13] D. Franke, Chronologie II", 114–125. In idem, *Heqaib*, XII, he shares the view rejecting the coregency of Amenemhet I and Senwosret I.

[14] C. Obsomer, *Sésostris I^er^. Étude chronologique et historique du règne* (Bruxelles, 1995).

the structure of his history and chronology crumbles although many gems remain in the details."[15] After a detailed investigation of Obsomer's arguments and the entire situation, K. Jansen-Winkeln came down clearly in favour of coregencies in 1997.[16]

In fact since Franke's summary, a number of new documents and archaeological evidence, particularly from the sites of the pyramid complexes of Dyn. 12, has appeared which objectively speaking can hardly be interpreted in a different manner. In the fundamental case, of the first royal transition from Amenemhet I to Senwosret I, the 10-year coregency of these first two kings is favoured not merely by the two main witnesses to which appeal is usually made (Stela Cairo CG 20516 naming both rulers in the field at the top with the regnal years "30" and "10" and Louvre C1 with a date naming both kings).[17] An architrave from Matariya published in 1990 names both kings symmetrically with their titularies and apparently as co-reigning builders; both are designated as *nsw bjt* and *living Horus* (i.e. as reigning king).[18] Finally, the control marks from Lisht published by F. Arnold reveal that it was only in regnal year 10 of Senwosret I that the construction of his pyramid began, i.e., apparently after the death and burial of Amenemhet I in his pyramid complex.[19] The description of the attack on Amenemhet I in the *Teaching of Amenemhat I* may have served, as Jansen-Winkeln suspected,[20] to legitimize the introduction of the institution; making, in any case, "a decision in favour of a coregency practically unavoidable".[21] The length of the reign of Senwosret I is somewhat more than

[15] R. D. Delia, *JARCE* 34 (1997), 267–268; sceptical is also C. Gallorini, *DE* 39 (1997), 135–137.

[16] K. Jansen-Winkeln, "Zu den Koregenzen der 12. Dynastie", *SAK* 24 (1997), 115–135. Beckerath, *Chronologie*, 133, also comes out in favour of the coregencies.

[17] Jansen-Winkeln (n. 16), 122–125.

[18] Both are also wished "eternal life", which clearly underscores that Amenemhet I could not have been dead at the time (cf. Ryholt, *Situation*, 273); A. Awadalla, "Un document prouvant la corégence d'Amenemhat et de Sesostris I", *GM* 115 (1990), 7–14; Jansen-Winkeln (n. 16), 125.

[19] F. Arnold, *The Control Notes and Team Marks* (New York: PMMA 23, 1991) 19ff., 30ff.; Jansen-Winkeln (n. 16), 125–126.

[20] K. Jansen-Winkeln, "Das Attentat auf Amenemhat I. und die erste ägyptische Koregentschaft", *SAK* 18 (1991), 241–264; idem (n. 16), 128–135. Cf., differently, N. Grimal, "Corégence et association au trône: l'Enseignement d'Amenemhet I^er^", *BIFAO* 94 (1994), 143–172.

[21] L. M. Berman, *Amenemhet I* (New Haven: Ph.D. Yale, 1985), 173–213. R. Leprohon, "The Programmatic Use of the Royal Titulary in the Twelfth Dynasty", *JARCE* 33 (1996), 167 now supports the coregency.

45 years (as deduced from the highest attested date in a graffito south of Amada and the entry in the *TC*, whereas Manetho has 46 years). A coregency of roughly 3 years with his successor can be plausibly deduced from the stela Leiden V.4, where apparently, regnal year 44 of Senwosret I is made equivalent to regnal year 2 of his son Amenemhet II.[22] A still more explicit equivalency of regnal years using the preposition *ḫft* comes from the coregency of Amenemhet II and Senwosret II, whose regnal year 3 is identified as the regnal year 35 of his predecessor in a stela near Konosso.[23] This date is also the highest recorded regnal year for Amenemhet II.

A regnal year 8 (9?) is preserved for Senwosret II on a stela from Toshka; and a "year 8" is also now known from the stela Cairo JE 59485.[24] It is therefore necessary to emend accordingly the Manethonian tradition and the figure of "19 years" in *TC* VI, 23 (see below). There would not appear to have been a coregency with his successor Senwosret III.

The debate over a short (19 year) or a long (39 year) reign for Senwosret III can now be viewed as resolved. A regnal year "39" found in the valley temple of the cenotaph of Senwosret III at Abydos in 1994 confirms a long reign,[25] supported by a control mark of year "30" from the royal pyramid complex at Dahshur,[26] and a reference to a first *sed*-festival of this king[27]—as had already been argued by W. Helck, W. Barta and J. v. Beckerath; *TC* VI, 24 indicates 30+ regnal years. In terms of relative chronology, this is not relevant as there had been a coregency with Amenemhet III since year 20,[28] and thus regnal year 20 of Senwosret III is identical to regnal year 1 of his son. It is in this

[22] Jansen-Winkeln (n. 16), 117–118.

[23] Jansen-Winkeln (n. 16), 118–119. See also W. K. Simpson, "Studies in the Twelfth Egyptian Dynasty III: Year 25 in the Era of the Oryx Nome and the Famine Years in Early Dynasty 12", *JARCE* 38 (2001), 7f.: Regnal year 43 of Senwosret I corresponds to (*ḫft*) year 25 of the nomarch Amenemhet.

[24] M. C. Stone, "Reading the Highest Attested Regnal Year Date for Senwosret II: Stela Cairo JE 59485", *GM* 159 (1997), 91–99.

[25] J. M. Wegner, "The Nature and Chronology of the Senwosret III—Amenemhet III Regnal Succession: Some Considerations Based on New Evidence from the Mortuary Temple of Senwosret III at Abydos", *JNES* 55 (1996), 249–279; cf. idem, *The Mortuary Complex of Senwosret II* (Philadelphia: PhD Thesis, 1996), 416.

[26] F. Arnold, "New Evidence for the Length of Reign of Senwosret III?", *GM* 129 (1992), 27–31.

[27] D. Arnold & A. Oppenheim, "Reexcavating the Pyramid Complex of Senwosret III at Dahshur", *KMT* 6/2 (1995).

[28] Jansen-Winkeln (n. 16), 119–120.

fashion that one must understand the change of dates in pBerlin 10055 from Illahun where a "year 19" is followed by a "year 1", which has previously been used by those favouring a short reign (M. Bietak, D. Franke) and would entail an emendation in Manetho and the *TC*.[29] Chronologically, it is these 19 years that must be accounted for in a relative chronology.

Until recently, the alternatives for Amenemhet III did not affect chronology: whether proposing a short reign for Senwosret III without a coregency (Franke) or a long reign with a 20-year coregency. With Senwosret's long reign confirmed, a chronological consequence would result if one rejected the coregency (as do Delia[30] and Obsomer).[31] However, the coregency is also confirmed by the presence of the names of both kings on scarabs and cylinder seals as well as fragments of inscriptions of the coronation ritual of Amenemhet III which was apparently performed by Senwosret III.[32]

The highest explicit regnal year attested for Amenemhet III is the 45th, but a "year 46" in the Illahun letters should probably also be assigned to him. A short coregency with Amenemhet IV is assured by a double date in a rock inscription at Semna (RIS 7), where the first regnal year of Amenemhet IV is made equivalent to regnal year 44 (or 46 or 48?) of Amenemhet III. The coregency is also supported by representations of two kings from the pyramid complex of Amenemhet III in Hawara.[33]

The *TC* records a reign of 9 years, 3 months and 27 days for Amenemhet IV. The highest date known from inscriptions is that of the 9th year (Sinai 122), but a "year 10 (?)" from the Illahun papyri may belong to him as well. His successor Nofrusobek reigned for 3 years, 10 months and 24 days according to the *TC*.[34] Her highest date documented epigraphically is regnal year 3 on a Nile level mark at Kumma.

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[29] See also Ryholt, *Situation*, 212 n. 728, who still assumes a short reign for Senwosret III and a one-year coregency with Amenemhet III.

[30] R. D. Delia, *A Study of the Reign of Senwosret III* (New York: PhD Thesis, 1980), 239–253.

[31] Obsomer (n. 14).

[32] Jansen-Winkeln (n. 16), 120; Ryholt, *Situation*, 212 n. 728.

[33] Cf. Franke, "Chronologie," 120; Ryholt, *Situation*, 209–210 with n. 716. This coregency is also supported by Leprohon (n. 21), 170.

[34] For her, cf. also V. G. Callender, "Materials for the Reign of Sebekneferu", in: Eyre, *Proceedings*, 227–236; S. Roth, *Die Königsmütter des Alten Ägypten von der Frühzeit bis zum Ende der 12. Dynastie* (Wiesbaden: ÄAT 46, 2001), 242–245 (against Ryholt's hypothesis of a kinship and its implications).

The original text of the *TC* seems to have corresponded to the dates known from epigraphical sources in almost every instance. The reigns preserved in the *TC* are:

Amenemhet I	(2)9 years	(*x*) months	(*x*) days
Senwosret I	45	(*x*)	(*x*)
Amenemhet IV	9	3	27
Nofrusobek	3	10	24

Rests of the entries (without names) of the four reigns between Senswosret I and Amenemhet IV are probably preserved on fr. 67 and have been discussed most recently by Krauss,[35] Franke,[36] and Ryholt.[37] The four lines give these numbers of regnal years:

TC	fr.	67,1	10 (or 20/30?) + *x*
		67,2	19
		67,3	30 (+ *x*)
		67,4	40 (+ *x*)

Of these, only *TC* fr. 67,2 has to be emended (19 instead of 9). The entire picture would thus be:

King	*Highest Year*	*Coregency with Successor*	*Turin Canon*
Amenemhet I	30	10 years	29 years
Senwosret I	45	2–3 years	45 years
Amenemhet II	35	3 years	10/20/30 + *x* years
Senwosret II	8/9	–	19 years
Senwosret III	39	20 years	30 + *x* years
Amenemhet III	46	1 year (?)	40 + *x* years
Amenemhet IV	10	9 y., 3 m., 27 d.	
Nofrusobek	3	3 y., 10 m., 24 d.	

35 Krauss, *Sothis*, 194–195.
36 Franke, "Chronologie I," 122, 126.
37 Ryholt, *Situation*, 14–15.

The total length of Dyn. 12 would be the sum of the reigns minus the coregencies, which amounts to ca. 181 years according to this table. This would confirm the year sum recorded by Eusebius of "182". By contrast, the sum in *TC* VI, 3 of "213 years, 1 month; 15/17/19 days" was simply the total of the individual reigns without subtracting the coregencies.[38]

3. *Dynastie 13*

Ryholt's monograph provides a comprehensive new discussion of Dyn. 13 which necessarily entails numerous shifts and reassignments of chronological positions. *TC* VII, 5—VIII, 27 listed a total of 51 kings, which he raises to 57, based on the restoration of lacunae which he postulates for the three *wsf*-notes in VII, 6, VII, 7 and VII, 17.[39] Manetho gives a total of 60 kings for Dyn. 13. In order to make the changes clear, I provide a table with both the traditional sequence (according to Franke) and the new one proposed by Ryholt in Fig. II. 7.1.

According to *TC* VII, 5, a king Wegaf founded Dyn. 13. As earlier H. Stock and K. A. Kitchen, Ryholt shifts this king 20 places so that he follows Amenemhet VII, since the names of Wegaf appear on both sides of the titulary of Amenemhet VII on the back of a statue base dedicated to Month in Medamud.[40] However, the fact that the name Wegaf was later added to the statue does not necessarily demand the assumption of a later reign (after Amenemhet VII). As only about 30 years separate the reign of Amenemhet VII and the foundation of the dynasty, it is also conceivable that a later reference to the founder of the dynasty by a king who may have been related to him was desired. In Ryholt's reconstruction, Sekhemreʿ-khutawy Sobekhotep I who is traditionally identified as Sobekhotep II and listed as the 16th king of the dynasty, opens Dyn. 13 which is justified by assuming an erroneous exchange of names in the *TC*. A definite judgement on the matter is not possible at present.[41]

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[38] Ryholt, *Situation*, 16 (partially based on other figures; differently also Franke, "Chronologie I," 122, 126f.; Krauss, *Sothis*, 198; Beckerath, *Chronologie*, 134.

[39] Ryholt, *Situation*, 72.

[40] Ryholt, *Situation*, 317–318.

[41] Positive is Allen in: Ben-Tor et al. (n. 3), 50; cf., however, Franke, "Chronologie II", 249.

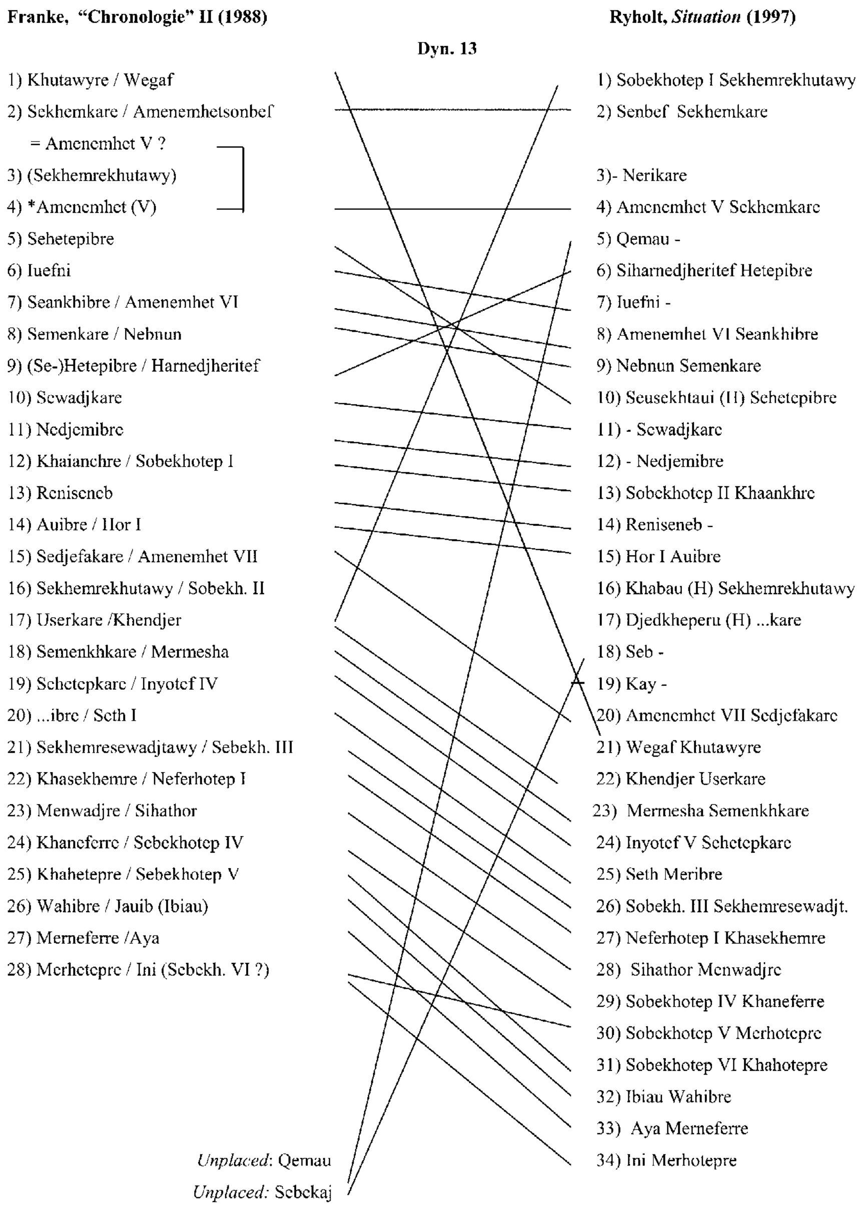

Franke, "Chronologie" II (1988)
Ryholt, *Situation* (1997)
Dyn. 13
1) Khutawyre / Wegaf
2) Sekhemkare / Amenemhetsonbef
= Amenemhet V ?
3) (Sekhemrekhutawy)
4) *Amenemhet (V)
5) Sehetepibre
6) Iuefni
7) Seankhibre / Amenemhet VI
8) Semenkare / Nebnun
9) (Se-)Hetepibre / Harnedjheritef
10) Sewadjkare
11) Nedjemibre
12) Khaianchre / Sobekhotep I
13) Reniseneb
14) Auibre / Hor I
15) Sedjefakare / Amenemhet VII
16) Sekhemrekhutawy / Sobekh. II
17) Userkare /Khendjer
18) Semenkhkare / Mermesha
19) Sehetepkare / Inyotef IV
20) ...ibre / Seth I
21) Sekhemresewadjtawy / Sebekh. III
22) Khasekhemre / Neferhotep I
23) Menwadjre / Sihathor
24) Khaneferre / Sebekhotep IV
25) Khahetepre / Sebekhotep V
26) Wahibre / Jauib (Ibiau)
27) Merneferre /Aya
28) Merhetepre / Ini (Sebekh. VI ?)
Unplaced: Qemau
Unplaced: Sebekaj
1) Sobekhotep I Sekhemrekhutawy
2) Senbef Sekhemkare
3)- Nerikare
4) Amenemhet V Sekhemkare
5) Qemau -
6) Siharnedjheritef Hetepibre
7) Iuefni -
8) Amenemhet VI Seankhibre
9) Nebnun Semenkare
10) Seusekhtaui (H) Sehetepibre
11) - Sewadjkare
12) - Nedjemibre
13) Sobekhotep II Khaankhre
14) Reniseneb -
15) Hor I Auibre
16) Khabau (H) Sekhemrekhutawy
17) Djedkheperu (H) ...kare
18) Seb -
19) Kay -
20) Amenemhet VII Sedjefakare
21) Wegaf Khutawyre
22) Khendjer Userkare
23) Mermesha Semenkhkare
24) Inyotef V Sehetepkare
25) Seth Meribre
26) Sobekh. III Sekhemresewadjt.
27) Neferhotep I Khasekhemre
28) Sihathor Menwadjre
29) Sobekhotep IV Khaneferre
30) Sobekhotep V Merhotepre
31) Sobekhotep VI Khahotepre
32) Ibiau Wahibre
33) Aya Merneferre
34) Ini Merhotepre

Fig. II. 7.1

Ryholt postulates a crisis of legitimacy at the start of Dyn. 13, on the assumption that Dyn. 14 had recently come to power. The double names of early Dyn. 13 would indicate a filiation that was to legitimize their rule. In this vein, a name such as Ameni Qemau would mean "Ameni's (Amenemhet's) son Qemau". However, the proposed early date for Dyn. 14 rests on very uncertain foundations and has probably to be rejected.[42] By contrast, the interpretation of the double names as filiations (without any further political implications) appears very plausible.[43] In the 2nd and 4th positions of the *TC* are "Amenemhetsenbef" and "Amenemhet" (V). Whereas Ryholt proposes reading "Amenemhet (IV)'s son Senbef", earlier scholars had considered that the two were identical.[44] The assumption of a name indicating filiation has implications for other relative positions at the start of Dyn. 13. King Ameni Qemau, who had not been assigned a firm place until now, probably also occupied a position in early Dyn. 13. If his double name is to be understood as a filiation, Qemau could, following Ryholt, be understood as the son of Ameni = Amenemhet V, and assigned the 5th position. A more convincing solution is that proposed by J. P. Allen where the fragmentary entry *TC* VI, 7 "Amenemhet" is believed not to denote Amenemhet V, but Amenemhet Qemaw, and thus the lacuna of *TC* VI, 6 would once have held the name of Amenemhet V.[45] The 5th position (Sehetepibreʿ) is shifted to place 10 by Ryholt.

The 3rd position in Dyn. 13, where only a figure of 6 regnal years is preserved in the *TC*, remains unclear. Ryholt fills this with a Nerikare, known from a Theban stela, on the basis of a Nile level mark at Semna, but the Semna record should be read in a different fashion.[46] Beckerath proposes the hypothetical Pentjini here, who is a ruler in the parallel provincial line in Abydos according to Ryholt.[47]

The following five rulers (places 6–9) are identical in both the traditional arrangement and in the new reconstruction, with only the last two Har-nedjheritef and Sehetepibreʿ having been switched. The *TC*

[42] Cf. the references above in note 10.
[43] Beckerath (n. 3), 434; Allen in: Ben-Tor et al. (n. 3), 50; Dodson (n. 3), 50.
[44] Ryholt, *Situation*, 208, 212.
[45] Allen in: Ben-Tor et al. (n. 3), 50.
[46] Beckerath (n. 3), 434. The existence of this king had earlier been thrown into doubt by L. Gabolde, "Nerkarê, a-t-il existé?", *BIFAO* 90 (1990), 213–222.
[47] Beckerath, *Chronologie*, 137.

records the throne name of Sehetepibreʿ for both so that an error must be in place in the case of Har-nedjheritef (with a throne name Hetepibreʿ). The reason for Ryholt's proposed switch of Har-nedjheritef (read as Sihar-nedjheritef by him) is the assumption of a filiation, as *Ḳmȝw zȝ* precedes the name in the cartouche. Ryholt takes the word "son" as the first part of the personal name, and interprets the sequence of the two names as a filiation: Qemaw's son Sihar-nedjheritef. Accordingly, he places the king immediately after his hypothetical father Qemaw. However, as the inverted filiation can be written with or without the word for "son", the proper name can still be read Har-nedjheritef; even as the son of Qemaw he could have come to power a few years after his father's reign.[48]

The next five positions are once again identical (Franke 10–14 = Ryholt 11–15). One should merely note that Sobekhotep bears the ordinal number "II" in Ryholt's reconstruction because the traditional Sobekhotep II has been shifted from the 16th place to the first. The last of these five kings is Hor (I) Awibreʿ, whose Horus name is attested on a reused block in Tanis together with the Horus name Khabaw. Ryholt therefore concludes that Khabaw Sekhemreʿ-khutawy was the successor of Hor (I) Awibreʿ (places 15 and 16), whereas the lost 3rd position of Dyn. 13 in the *TC* was customarily reserved for him.[49]

Accounting for the fact that neither does Khabaw Sekhemreʿ-khutawy follow Awibreʿ in the *TC*, nor does a certain Djedkheperu (Horus name) attested in seal impressions from Uronarti alongside Khabaw's, but immediately Amenemhet VII Sedjefakareʿ (*TC* VII, 18), Ryholt postulates a lacuna of four places in the *Vorlage* of the *TC*, to be filled by Khabaw, Djedkheperu, Seb and Kay.[50] To Djedkheperu he assigns the Osiris bed from Abydos,[51] and suggests that the effaced titulary consisted in the name of Hor (I Awibre) as the beginning of his proper name and simultaneously filiation, but J. P. Allen has plausibly argued that it was Pentjini who was responsible for the inscription.[52]

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[48] N. Swelim & A. Dodson, "On the Pyramid of Ameny-Qemau and Its Canopic Equipment", *MDAIK* 54 (1998), 330, suggest that Har-nedjheritef was only the fourth successor of his father.

[49] Critically, and with an alternative Ben-Tor et al. (n. 3), 50.

[50] Ryholt interprets the note *wsf* of the *TC* as an indication of a lacuna in the *Vorlage*, not as a reference to a king whose name had been deliberately omitted. For this question, cf. C. Bennett, "King Qemau: a Reconsideration", *GM* 159 (1997), 11–17.

[51] This was assigned to Khendjer by A. Leahy and to Nebiriraw II by Beckerath.

[52] Allen in: Ben-Tor et al. (n. 3), 50–51.

Ryholt postulates *Seb* and *Kay* as new kings of Dyn. 13, as he dissolves the proper name Sebkay (*Sbkꜣy*) on the magic ivory CG 9433 (JdE 34988) into the filiation, "Seb's son Kay". Since Amenemhet VII names himself Kay-Amenemhet, three generations of kings would thus have reigned within the span of a few years. This "daring construction" (J. von Beckerath)[53] which in addition requires the postulation of a lacuna in the *Vorlage* of the *TC* does not seem necessary. If we do not move Sobekhotep II from his traditional place 16 to the top of the dynasty (against Ryholt), the proper name of the magic ivory can be assigned to him. In this case we would have a pet form of a divine name formed by means of the suffix -*li*. In the NK this suffix was written <*nr*>, <*nrj*< (*Hali* for Hathor, *Wurel* for Weret),[54] for which in Dyn. 13 a notation with <ꜣ> would have been mandatory. The sounding of the name would thus have been something like Sabkuli. The possible patronymic for Amenemhet (*Kꜣy* = Kuli) would be the abbreviated form, so that Sobekhotep II (and not an otherwise unknown *Kꜣy*) should be viewed as the father of Amenemhet. This would require a switch between *TC* VII, 18 and *TC* VII, 19 at the most. Amenemhet VII is followed in the traditional chronology by Sobekhotep (II) Sekhemre-khutawy, and by Wegaf who has changed places with him according to Ryholt.

This takes us into uncontested territory: the following 16 kings of Dyn. 13 are arranged in the same succession in the two competing reconstructions, with a single minor variation: Sobekhotep Merhotepreʿ would be inserted as Sobekhotep V between Sobekhotep IV Khaneferreʿ and Sobekhotep VI (previously labelled 'Sobekhotep V'), and his identification with Ini Merhotepreʿ completely abandoned.[55] A relief from the reign of Neferhotep I depicting the enthroned prince of Byblos Antin serves as the traditional basis for the synchronism between Egypt and Babylonia for the first half of the second millennium BC (Neferhotep: Jantinʿammu of Byblos: Zimrilim of Mari: Hammurabi),[56] which is, however, probably not reliable.[57]

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[53] Beckerath (n. 3), 434; a similar appreciation by Grajetzki (n. 3), 155; cf. Allen in: Ben-Tor et al. (n. 3), 51.

[54] T. Schneider, *Asiatische Personennamen in ägyptischen Quellen des Neuen Reiches* (Freiburg: OBO 114, 1992), 276–277.

[55] Ryholt, *Situation*, 231–232.

[56] E. Hornung, "Lang oder kurz?—Das Mittlere und Neue Reich Ägyptens als Prüfstein", in: *High, Middle or Low? 1*, 27–36; K. A. Kitchen, "The Basics of Egyptian Chronology in Relation to the Bronze Age", in: *High, Middle or Low? 1*, 37–55; Franke, "Chronologie II", 273–274; Ryholt, *Situation*, 87–88.

[57] C. Eder, *Die ägyptischen Motive in der Glyptik des östlichen Mittelmeerraumes zu Anfang des*

Aya Merneferreʿ is the last ruler of the dynasty attested in both the north and the south, whereas his successor Ini Merhotepreʿ is the first to be only attested in southern Egypt. The lower part of TC's column VII (Ryholt's eighth column)—after Sobekhotep VII Merikawreʿ; *TC* VII, 8—is very badly preserved after a long gap. At the end of the column (now lost) was probably the total for Dyn. 13 and the start of Dyn. 14, which continued on column VIII (Ryholt's ninth column), with Nehesi in *TC* VIII,1.[58] That Nehesi should have had five predecessors which would justify the postulation of an additional lacuna in the *Vorlage* of the *TC*[59] is hardly plausible.[60]

Of the lengths of the reigns of Dyn. 13 kings in the *TC*, the following entries display preserved year dates:[61]

TC VI, 5	Wegaf	2 years, 3 months, 24 days
TC VI, 6	*wsf*	6 years
TC VI, 7	Amenemhet V	3 or 4 years
TC VI, 8	Sehetepibreʿ	1–4 years
TC VI, 14	Nedjemibreʿ	0 years, 7 months
TC VI, 16	Reniseneb	0 years, 4 months
TC VI, 24	Sobekhotep III	4 years, 2 months
TC VI, 25	Neferhotep I	11 years, 1–4 months
TC VI, 26	Sihathor	0 years, 1 + *x* months, 3 days
TC VII, 1	Sobekhotep V^{T}/VI^{R}	4 years, 8 months, 29 days
TC VII, 2	Ibiau	10 years, 8 months, 28 days
TC VII, 3	Aya	23 years, 8 months, 18 days
TC VII, 4	Ini	2 years, 2–4 months,[62] 9 days
TC VII, 5	Sewadjtu	3 years, 2–4 months
TC VII, 6	Ined	3 years, 1 months, 1 day
TC VII, 7	Hori	5 years, ? months, 8 days
TC VII, 8	Sobekhotep VII	2 years, ? months, 4[63] days

2 Jts. v.Chr. (Leuven: OLA 71, 1996), 13; T. Schneider, *ZDPV* 114 (1998), 184–188. Jantin itself would have been a hypocoristic abbreviation of Jantinʿammu, but what we have is only ʾAntin.

[58] For Nehesi, see now A. Loprieno, "*Nḥsj*, 'der Südländer'?", in: *Stationen*, 211–217.

[59] Ryholt, *Situation*, 94.

[60] See above, notes 8–10. Spalinger (n. 3), 297 assumes (following Ryholt) that it is demonstrated that Sheshi belongs in early Dyn. 14, whereas this assignment is disputed by Ben-Tor et al. (n. 3), 61.

[61] Cf. Ryholt, *Situation*, 192, and Fig. 10 with the sheet joins as opposed to Franke, "Chronologie II", 267ff.

[62] Franke, "Chronologie II", 267ff. has "2" months, Ryholt "3–4"; cf. however *TC* VIII, 5, and thus "2–4".

[63] Ryholt, *Situation*, 192 has erroneously "3" days.

Down to the reign of Aya, a minimum of 100 years must be accounted for since the beginning of Dyn. 13. The last ca. 25 kings of Dyn. 13 are very badly documented in the epigraphic material, and their monuments are restricted to a few places (Abydos, Thebes, Deir el-Bahri, Gebelein, Edfu). "By the end of Aya's 24-year reign, the administration seems to have collapsed [. . .] This period further witnessed no less than 24 kings, whose reigns on the average lasted little more than one year."[64] In place of a precise chronology, we can merely estimate a total of some two decades, after which Dyn. 13 would be immediately followed by the new Theban dynasty (Dyn. 17 according to the traditional version;[65] "Dyn. 16" according to Ryholt).[66] There are some dated monuments for a few kings data for whose reigns are not preserved in the TC: Sobekhotep II^{T}/I^{R} (year 4), Amenemhet-Senbef (year 5), Khendjer (year 5), Sobekhotep IV (year 9) and a few additional of contested attribution.[67] The only indication of the total length of Dyn. 13 remains the total given by Manetho of 453 years, which is usually emended to *153 or 133 (Beckerath) years and represents the basis for approximate estimates of 133 years (Beckerath),[68] some 130 years (Franke),[69] 152 years (Kitchen),[70] and 154 years (Ryholt);[71] cf. our final remarks in section 6.

4. *Dyn. 17 (Ryholt: "Dyn. 16" & "Dyn. 17")*

4.1. *Generalities* Arranging the relative chronology of the kings attested in the Thebaid between Dyns. 13 and 18 is one of the most difficult challenges of the SIP. The traditional reconstruction of Dyn. 17 assumes 15 rulers, based on the sum in *TC* XI, 15 (which must apparently be emended to "15"); these kings would have been named in *TC* X, 31–XI, 14.[72] Against this, Ryholt (following H. E. Winlock) postulates two

[64] Ryholt, *Situation*, 298.
[65] Franke, "Chronologie II", 259.
[66] Ryholt, *Situation*, 302.
[67] Ryholt, *Situation*, 193f. For the dates in pBoulaq 18 and pBrooklyn 35.1446 see also Franke, "Chronologie II", 254f. and esp. S. Quirke, *The Administration of Egypt in the Late Middle Kingdom. The Hieratic Documents* (New Malden, 1990).
[68] Beckerath, *Untersuchungen*, 220f.
[69] Franke, "Chronologie II", 265; table, 267ff.
[70] Kitchen (n. 56), 45.
[71] Ryholt, *Situation*, 195–196.
[72] Beckerath, *Untersuchungen*, 194f.; Ryholt, *Situation*, 151.

Theban dynasties, "one prior and one subsequent to the Hyksos conquest of the south". He assignes all the aforementioned 15 places of the *TC* to his *first* Theban dynasty, which he terms "Dyn. 16", correcting an error in the terminology of Africanus and traditional research (where Dyn. 16 were considered princes and vassals of Dyn. 15), whereas the designation "Dyn. 17" applies exclusively to his *second* Theban dynasty.[73] This "Dyn. 17" would have been listed in a now lost column of the *TC*, being separated from "Dyn. 16" by an alleged local dynasty in Abydos (*TC* XI, 16–31).[74]

That allowance must be made for more space after the end of Dyn. 13 for kings of the Thebaid than is permitted in the traditional 15 places is an indisputable fact which means that Ryholt's revision is a welcome attempt. It is, however, reasonable to suppose that the correct reconstruction could have a different appearance. According to Beckerath,[75] a column might have been lost after *TC* X (with the first entry being *TC* X, 31), and this column would have included all of the Theban kings as a single dynasty; only then would one have to add the rulers from Abydos. Beckerath proposes that all of the Theban kings between Dyns. 13 and 18 be termed "Dyn. 16", and that the local dynasty at Abydos be termed "Dyn. 17". A. Spalinger[76] is also opposed to assuming two Theban dynasties, divided by the postulated Hyksos conquest of Thebes.

Ryholt concludes that the number of Theban rulers was 15 ("Dynasty 16", listed in the *TC*) + about 10 ("Dynasty 17", known from the monuments and lasting a maximum of ca. 40 years). Taking Beckerath's version of Ryholt's reconstruction, the succession of Theban rulers would be from *TC* X, 31 through Beckerath's new column "Xa" to *TC* XI, 14 (with the total in *TC* XI, 15), which would thus include 1+31+14 = 46 places, nearly twice as many as in Ryholt's approach. This is not conceivable for chronological reasons and with regard to the extant epigraphical evidence.

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[73] King Sekhemreʿ-wahkhaw Raʿhotep, traditionally viewed as second king of Dyn. 17, occupies the first place in Ryholt's Dyn. 17 (Dyn. $17^{R}/1$ *vs.* Dyn. $17^{T}/2$) and is thus moved 14 places away. Sobekemsaf (traditionally I, Ryholt: II) has been shifted 18 places.

[74] Ryholt, *Situation*, 164.

[75] Beckerath (n. 3), 434.

[76] Spalinger (n. 3), 298: "There is little evidence for a Theban dynasty à la Ryholt unless we reinterprete the data to suit the hypothesis."

Regardless of the judgment of the order in the *TC*, we must concur with Ryholt that the total number of Theban rulers between Dyns. 13 and 18 cannot be higher than 25. However, a division of the sequence into two dynasties based upon Ryholt's postulated Dyn. 15 Hyksos conquest of Thebes is just as difficult to accept as Ryholt's proposed scorched earth policy during the withdrawal of Apopis from the south.[77] It is entirely possible that there was originally a division of two groups of kings in the *TC*, but this may have resulted from other considerations (cf. below). These 25 kings at the most seem not to have ruled longer than 90–115 years.

4.2. *Dyn. 17 (Ryholt: "Dyn. 16" & "Dyn. 17")—Details* The issue of ordering these kings is extremely complex due to the state of preservation of the TC and the epigraphic situation. Even for the more important rulers and their families, the data is fragmentary and open to diverse interpretations. Three problems of the interconnected families of Inyotef/Sobekemsaf should suffice as exemplary in prohibiting a definitive resolution of the issue.

1) Inyotef Nebukheperreʿ's consort Sobekemsaf (N.B. "Sobek is his (!) protection"), presumably the daughter (or granddaughter?) of a king, seems to have been named after a king Sobekemsaf; and the name Sobekemsaf was also borne by Raʿhotep's consort (or mother?).[78] Both the identity of the Queen(s) Sobekemsaf and the identity of the king Sobekemsaf are subject to debate.

2) Whether this king was the father of Inyotef Nebukheperreʿ or merely an indirect predecessor depends upon the interpretation of a newly found fragmentary inscription on the Luxor-Farshut road.[79]

3) The precise placement of the Inyotef kings, the Sobekemsaf kings and the king Raʿhotep is subject to controversy. That a prince with the basilophorous names Inyotefmose was praised by a king Sobekemsaf for his actions during a Sokar festival could demand at the most the placing of a king Sobekemsaf after the Inyotef kings.[80]

The following brief presentation attempts to provide a solution along this line of arguments: A detailed discussion must take account of the

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[77] Ryholt, *Situation*, 143–148.

[78] Ryholt, *Situation*, 265–266, 268ff.

[79] J. C. Darnell & D. Darnell, "The Luxor-Farshût Desert Road Survey", *Oriental Institute Annual Report* (1992–93), 50, fig. 4; Ryholt, *Situation*, 270.

[80] Ryholt, *Situation*, 170.

aforementioned differences between Ryholt's interpretation of the *TC* and Beckerath's response to it (cf. above, with Figure). One possible solution is to reject the proposed additional column *TC* Xa (with Ryholt, against Beckerath), while simultaneously assuming (with J. P. Allen, against Ryholt)[81] that all of the Theban rulers between Dyns. 13 and 18 were originally listed between *TC* X, 31 and *TC* XI, 25. A first group (*TC* X, 31–XI, 14) would close with the total at *TC* XI, 15; and then 9 additional rulers would follow in *TC* XI, 16–XI, 24 whose total would once have been noted in *TC* XI, 25 (before the inception of fr. 163).[82] The division into two groups could easily have been motivated by their lineage or residence (e.g., Thebes vs. Dendera).[83]

The five kings mentioned on fr. 163 would only be inserted then, and possibly others on a possible column "XII". That these will have been Abydenian rulers—Ryholt suggests that the remainder of his Abydos dynasty was listed here—is not demonstrable since the traces of the names do not match any epigraphically attested names.

Despite diverging on the reconstruction of *TC* XI, I agree with Ryholt in the number of rulers who can be viewed as Theban kings between Dyns. 13 and 18. In addition to the 15 places given in the *TC* (i.e., the traditional Dyn. 17), Ryholt names 9 kings of a "second Theban dynasty" (i.e. his "Dyn. 17"). According to the placement of these rulers in *TC* XI such as proposed above, there would in fact be exactly that many places.

The first three places of *TC* XI are damaged and begin with *Sḫm-rʿ-*, *Sḫm-rʿ-* and *Sḫm-rʿ-s-*. The traditional restoration (since H. Stock) to the throne names *Sḫm-rʿ-wꜣḥ-ḫʿw* (= Raʿhotep), *Sḫm-rʿ-wꜣḏ-ḫʿw* (= Sobekemsaf I) and *Sḫm-rʿ-smn-tꜣwj* (= Djehuti) has recently been thrown into doubt by Beckerath himself, who considers Raʿhotep as doubtful, the third place as completely uncertain, and views only Sobekemsaf I as certain.[84] On account of their building activity in Abydos and their restorations in Medamud and Coptos, Ryholt places Raʿhotep and Sobekemsaf Sekhemreʿ-wadjkhaw in his chronologically

[81] Allen in: Ben-Tor et al. (n. 3), 49.

[82] An alternative placing of the fragments is not possible; cf. W. Helck, "Anmerkungen zum Turiner Königspapyrus", *SAK* 19 (1992), 151–216.

[83] Cf. below, text referring to n. 111.

[84] J. v. Beckerath, "Theban Seventeenth Dynasty", in: E. Teeter & J. A. Larson, eds., *Gold of Praise. Studies on Ancient Egypt in Honor of Edward F. Wente* (Chicago: SAOC 58, 1999), 23–24. The earlier sequence can still be found in Beckerath, *Chronologie*, 139.

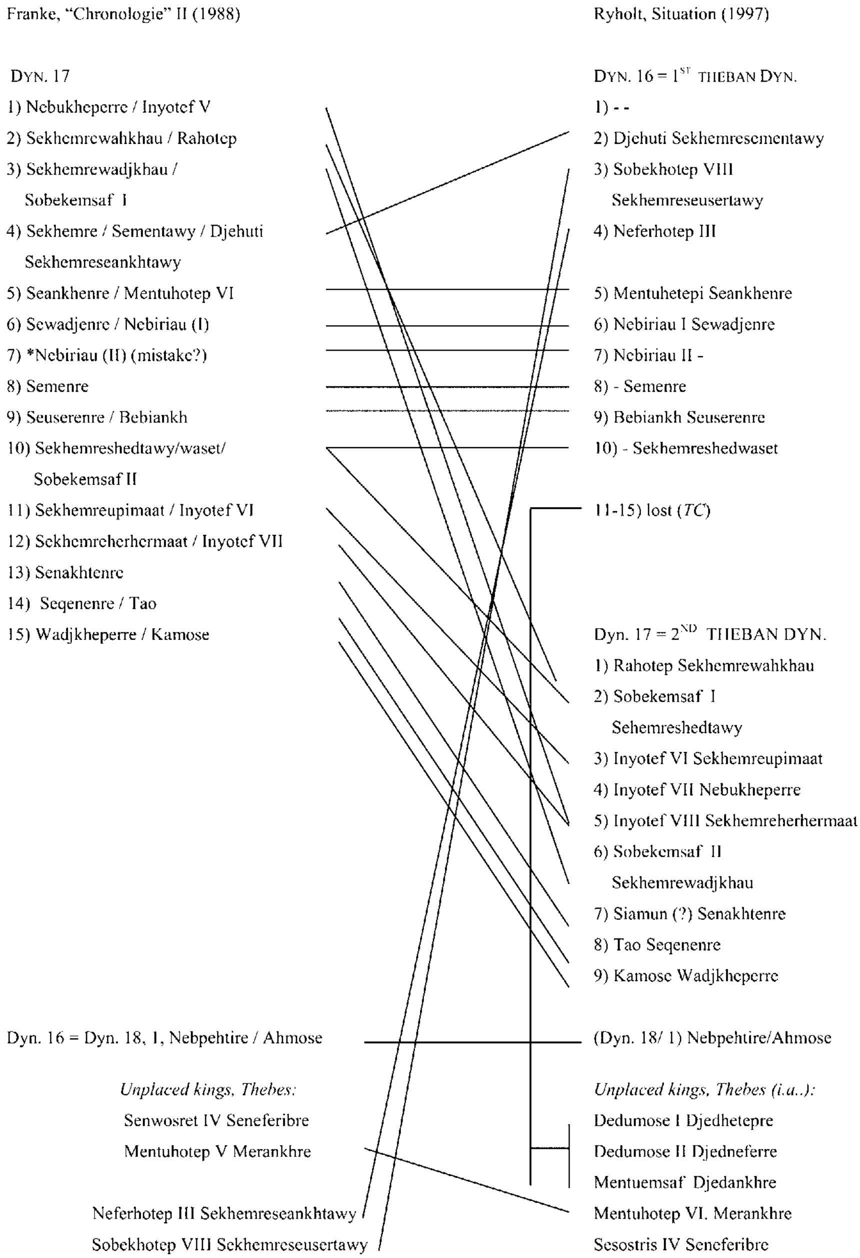

Franke, "Chronologie" II (1988)
Ryholt, Situation (1997)
DYN. 17
1) Nebukheperre / Inyotef V
2) Sekhemrewahkhau / Rahotep
3) Sekhemrewadjkhau / Sobekemsaf I
4) Sekhemre / Sementawy / Djehuti Sekhemreseankhtawy
5) Seankhenre / Mentuhotep VI
6) Sewadjenre / Nebiriau (I)
7) *Nebiriau (II) (mistake?)
8) Semenre
9) Seuserenre / Bebiankh
10) Sekhemreshedtawy/waset/ Sobekemsaf II
11) Sekhemreupimaat / Inyotef VI
12) Sekhemreherhermaat / Inyotef VII
13) Senakhtenre
14) Seqenenre / Tao
15) Wadjkheperre / Kamose
DYN. 16 = 1ST THEBAN DYN.
1) - -
2) Djehuti Sekhemresementawy
3) Sobekhotep VIII Sekhemreseusertawy
4) Neferhotep III
5) Mentuhetepi Seankhenre
6) Nebiriau I Sewadjenre
7) Nebiriau II -
8) - Semenre
9) Bebiankh Seuserenre
10) - Sekhemreshedwaset
11-15) lost (TC)
Dyn. 17 = 2ND THEBAN DYN.
1) Rahotep Sekhemrewahkhau
2) Sobekemsaf I Sehemreshedtawy
3) Inyotef VI Sekhemreupimaat
4) Inyotef VII Nebukheperre
5) Inyotef VIII Sekhemreherhermaat
6) Sobekemsaf II Sekhemrewadjkhau
7) Siamun (?) Senakhtenre
8) Tao Seqenenre
9) Kamose Wadjkheperre
Dyn. 16 = Dyn. 18, 1, Nebpehtire / Ahmose
(Dyn. 18/ 1) Nebpehtire/Ahmose
Unplaced kings, Thebes:
Senwosret IV Seneferibre
Mentuhotep V Merankhre
Neferhotep III Sekhemreseankhtawy
Sobekhotep VIII Sekhemreseusertawy
Unplaced kings, Thebes (i.a..):
Dedumose I Djedhetepre
Dedumose II Djedneferre
Mentuemsaf Djedankhre
Mentuhotep VI. Merankhre
Sesostris IV Seneferibre

Fig. II. 7.2

later "Dyn. 17"[85] and restores *TC* XI, 1–3 with the throne names *Sḫm-rʿ-smn-tȝwj* (= Djehuti), *Sḫm-rʿ-swsr-tȝwj* (= Sobekhotep VIII) und *Sḫm-rʿ-sʿnḫ-tȝwj* (= Neferhotep III), of whom the last two were traditionally acknowledged as contemporary but had not been placed.[86] Djehuti is thus shifted only two places in contrast to the traditional sequence (Dyn. 17$^{\text{T}}$/4 and "Dyn. 16"$^{\text{R}}$/2).[87] Placing Neferhotep III here is favoured by the position of Seʿankhenreʿ Mentuhotpi (Mentuhotep VI) in *TC* XI, 4, as two similarly executed stelae of the two kings could possibly have come from the same workshop.[88] The next five places *TC* XI, 5–9 are preserved whereby *TC* XI, 6 (Nebiriaw II) could be a copying error[89] and in *TC* XI, 9 Sekhemreʿ-shedwaset (as traditionally maintained) might be a deliberate change for the correct Sekhemreʿ-shedtawy = Sobekemsaf [I].[90] The proper name of *TC* XI, 7, Semenenreʿ, is unknown; as the successor is named "Bebiankh" and "Bebi" is a possible abbreviation of a name containing the element "Sobek",[91] one could speculate on a Sobek-name. Of the following five places (*TC* XI, 10–14), only the insignificant beginning is preserved, before the total (*TC* XI, 15). *TC* XI, 15–17 apparently introduces a new group of kings.

The main difficulty here is the correct restoration of the five places before the sum. If one places the traditional Dyn. 17 in *TC* X, 31–XI, 14, the last three places are occupied by Senakhtenreʿ, Seqenenreʿ Tao and Wadjkheperreʿ Kamose.[92] Ryholt assigns to these positions the

[85] Ryholt, *Situation*, 152, 170. Caution is, however, advised in basing the restoration of Sobekemsaf Sekhemreʿ-wadjkhaw on the alleged destruction of the Thebaid by the Hyksos (145–146; 170).

[86] N. Dautzenberg, "Neferhotep III. und Sebekhotep VIII.", *GM* 140 (1994), 19–25, also views the second as being the immediate successor, but places them in Dyn. 13. The same restoration for TC *XI*, 2 was accomplished by C. Bennett, "The First Three Sekhemre Kings of the Seventeenth Dynasty", *GM* 143 (1994), 21–28.

[87] A connection to Dyn. 13 follows via the vizier Ibiaw, for which link one should note the critical remarks by Grajetzki (n. 3), 151–152. Franke, *Heqaib*, 79 is more positive.

[88] P. Vernus, "La stèle du roi Sekhemsankhtaouyrê Neferhotep Iykhernofret (Stèle Caire JE 59635) et la domination Hyksos", *ASAE* 68 (1982), 129–135 with pl. I; idem, "La stèle du pharaon *Mnṯw-ḥtpỉ* à Karnak: Un nouveau témoignage sur la situation politique et militaire au début de la D.P.I.", *RdE* 40 (1989), 145–161, pls.6–7; Ryholt, *Situation*, 154. Beckerath, *Chronologie*, 139, places Senwosret IV Seneferibreʿ at *TC* XI, 4.

[89] Franke, "Chronologie II", 263.

[90] Following Beckerath, *Untersuchungen*, 168, 290, *contra* Ryholt, *Situation*, 156.

[91] P. Vernus, *Le surnom au Moyen Empire* (Rome: Studia Pohl 13, 1986), 111 n. 122; cf. the two sons of Sobekhotep VII Merkawreʿ with the names Bebi and Sobekhotep (Ryholt, *Situation*, 235–236).

[92] Franke, "Chronologie II", 271.

rulers Dedumose I, Dedumose II, Mentuemsaf, Mentuhotep (VI^{R}) Merʿankhreʿ and Senwosret IV Seneferibreʿ, who are documented epigraphically at Thebes but had not been positioned chronologically. However, the Dedumose kings certainly belong in Dyn. 13.[93] If one follows the scheme outlined above, with the assumption that further Theban kings down to Kamose were named in *TC* XI, 16–XI, 25, we face the question of the placement of the kings Inyotef/Sobekemsaf/Raʿhotep and thus of the exact relationship between the late Dyn. 13 and the kings named between *TC* X, 31 and *TC* XI, 25.

As Ryholt correctly notes, the traditional placing of Nebukheperreʿ Inyotef (V) at the beginning of Dyn. 17 (his "Dyn. 16"), in the lost entry at *TC* X, 31, cannot be justified. D. Polz, who succeeded in finding the tomb of the king in Dra Abu'l Naga in 2001, argues likewise for situating him before the final kings of Dyn. 17.[94] Such a placement is likewise favoured by the evidence of the box of Minemhat, who was mayor of Coptos under Inyotef V, which was part of the funerary equipment of an Aqher who lived under Seqenenreʿ.[95]

From the legend on the coffin Louvre E 3019, it follows that Inyotef Nebukheperreʿ (Dyn. 17^{T}/1: Inyotef V; Dyn. 17^{R}/4: Inyotef VII) arranged the burial of his brother Inyotef Sekhemreʿ-upimaat (Dyn. 17^{T}/11: Inyotef VI; Dyn. 17^{R}/3) and must therefore have followed him on the throne.[96] In his *Untersuchungen*, Beckerath had viewed Inyotef Sekhemreʿ-upimaat (VI) and Inyotef Sekhemreʿ-herhermaat (VII) as brothers, whereas he had separated Inyotef Nebukheperreʿ (VI; coffin BM 6652) from them as a king he considered not necessarily related to them, placing him at the beginning of the dynasty. Ryholt equally bases his arguments upon a consistent palaeographic peculiarity (the *Pleneschreibung* of "*j*") in the case of the coffin of Inyotef Sekhemreʿ-herhermaat

[93] Franke, *Heqaib*, 77–78.

[94] D. Polz & A. Seiler, *Die Pyramidenanlage des Königs Nub-Cheper-Re Intef in Draʿ Abu el-Naga. Ein Vorbericht* (Maniz: DAIKS 24, 2003). J. C. Darnell views Inyotef Nebukheperreʿ as the addressee of a newly discovered royal hymn at Wadi el-Hôl; however, the king is not named ("A New Middle Egyptian Literary Text from the Wadi el-Hôl", *JARCE* 34 [1997], 85–100).

[95] H. Winlock, *JEA* 10 (1924), 258 with n. 1 (taking up an idea of P. Newberry); W. Helck, "Der Aufstand des Tetian", *SAK* 13 (1986), 126 (who erroneously refers to a spoon; the spoon from the burial of Aqhor came from a mayor Sobekwer). In favour of a placement in late Dyn. 17 (as traditionnally conceived) is N. Dautzenberg, "Die Wahl des Königsnamens in der Hyksoszeit", *GM* 159 (1997), 43–52, based on the titulary.

[96] Ryholt, *Situation*, 270.

(Dyn. 17^{T}/12: Inyotef VII; Dyn. 17^{R}/5: Inyotef VIII; Louvre E 3020) so that he becomes an ephemeral coregent of Inyotef Nebukheperreʿ.[97] However, this "stock coffin" was certainly not originally intended for Inyotef Nebukheperreʿ, and to infer from it any hypothetical coregency is doubtful in the extreme.[98]

Placing the three Inyotef kings together appears to be plausible, not the least on account of their canopic equipment.[99] It seems possible that the legend on Louvre E 3020 can be used to argue that Inyotef Sekhemreʿ-herhermaat (VIII) was the son of Inyotef (VI) Sekhemreʿ-upimaat,[100] which would produce the sequence: Inyotef (VI) Sekhemreʿ-upimaat ("the elder")—Inyotef (VII) Nebukheperreʿ—Inyotef (VIII) Sekhemreʿ-herhermaat.

If we can identify Sobekemsaf, the consort of Nebukheperreʿ with the mother of Raʿhotep (presumably) of the same name,[101] then Raʿhotep would have to be placed chronologically after Nebukheperreʿ.[102] The evidence is of similar ambiguity with regard to the mutual position of Raʿhotep and Sobekemsaf Sekhemreʿ-wadjkhaw. If a prince Ameni whom Raʿhotep grants a bow, arrows and the right to participate in the ceremonies for Min of Coptos, is identical to the son-in-law of Sobekemsaf Sekhemreʿ-wadjkhaw, then Raʿhotep would plausibly be "a close predecessor of Sechemreʿ-wadjkhau Sobekemsaf".[103] If the two are

[97] Cf. Ryholt, *Situation*, 267–268.; the earlier discussions will be found in Beckerath, *Untersuchungen*, 267f.

[98] Dodson (n. 3), 50–51; Spalinger (n. 3), 300.

[99] A. Dodson, *The Canopic Equipment of the Kings of Egypt* (London, 1994), 42; C. Bennett, "The Date of Nubkheperre Inyotef", *GM* 147 (1995), 19–27 (22f.: all three Inyotefs closely associated).

[100] The coffin was not originally manufactured for Inyotef Nebukheperreʿ (A. Dodson). When the coffin was reworked, the <y> of the name of Inyotef was replaced with <ʿꜣ>. An explanation can be found in assuming that the correction was an attempt at specification: the proper name Inyotef, "The one who brings back his father" is an *Ersatzname* (a newborn child is believed to replace a recently deceased relative, in this case the father). The insertion of <ʿꜣ> and the addition of the throne name would have adapted the meaning of the name to the contemporary situation: "he who brings back *the elder*, his father, Sekhemreʿ-herhermaat". As the epithet <ʿꜣ> "the elder" is only attested for Sekhemreʿ-upimaat, it would follow that Inyotef Sekhemre-herhermaat was the son of Inyotef Sekhemreʿ-upimaat.

[101] For the discussion, cf. Ryholt, *Situation*, 265–268 (who rejects the identification).

[102] Ryholt, *Situation*, 170, opposes this order: "Likewise, it may be argued that Raʿhotep, whose restoration of the temple of Min at Coptos is described on a stela, was a predecessor of the Inyotef kings, since such a claim could hardly have been made in the years subsequent to the reign of Inyotef N[ebucheperreʿ] who built extensively at this temple."

[103] C. Bennett, "The First Three Sekhemre Kings of the Seventeenth Dynasty", *GM* 143 (1994), 21–28.

not the same,[104] then the chronological place of Sobekemsaf Sekhemreʿ-wadjkhaw is completely uncertain; rather than placing him, with Ryholt, after the Inyotef kings,[105] he could also precede them, perhaps after Sekhemreʿ-shedtawy Sobekemsaf (I) or even in the lost entry at *TC* X, 31.[106] A possible candidate for *TC* X, 31 or one of the other open places could, however, also be seen in Sekhemreʿ-neferkhaw Wepwawtemsaf (previously unplaced, assigned by Ryholt to the Abydos dynasty).

In principle, the block of the Inyotef kings and Raʿhotep could have stood in *TC* XI, 10–14 or else in *TC* XI, 18–21 (with the four following entries to be restored as Senakhtenre/Seqenenreʿ/Kamose/total). In view of these possibilities, of particular interest are the two entries where the beginning is still preserved in *TC* XI, 16 and *TC* XI, 17, which Ryholt views as undocumented throne names of kings of his postulated Abydos dynasty. In *TC* XI, 16 *Weser-. . . rʿ* is preserved, and in *TC* XI, 17 probably only *Wsr* without the solar disk,[107] i.e., there is a proper name as in *TC* VIII (Ryholt: IX), 1 (*Nḥsj*), *TC* XI, 5/6 *Nb-jrj-ꜣw*, and elsewhere.[108] For both places, which have not hitherto been explained, a restoration can be suggested:

- In the tablet of kings from Karnak, the fourth row (no. 27) has a royal name *Wsr-n-rʿ* along with Seqenenreʿ, Senakhtenreʿ and Inyotef Nebukheperreʿ, who has usually been emended to the *Swsr-n-rʿ* named in *TC* XI, 8.[109] However, the kings to be placed in *TC* X, 31–XI, 14 (including *Swsr-n-rʿ*) are certainly listed in other rows of the tablet of kings if the assignment of kings to the *TC* passage as proposed above can be accepted.
- A king who fits well with the notation beginning *Wsr-* at *TC* XI, 17 is the hitherto unsituated Senwosret (IV) Seneferibreʿ, known from a colossal statue and a stela in Karnak as well as blocks from Tod and Edfu.[110]

[104] Ryholt, *Situation*, 266, 272 (the names display different endings: Amanja, Amana).
[105] Decisive for Ryholt is the praise of a king Sobekemsaf for a Inyotefmose, whom Ryholt places after the Inyotef kings due to his basilophorous name.
[106] Franke, *Heqaib*, 84: the dyad of king Sobekemsaf Sekhemreʿ-wadjkhaw with Satet is characteristic for the beginning of Dyn. 17.
[107] The *weser*-sign follows on the cartouche more closely than in *TC* XI, 16.
[108] In detail: Ryholt, *Situation*, 27–28.
[109] Beckerath, *Untersuchungen*, 27; idem, *Handbuch*, 126. It is less probable that the Beni Hasan graffito (cf. Beckerath, *Untersuchungen*, 69) should be read as Weserreʿ[-neferkhaw].
[110] Ryholt, *Situation*, 391 (16/e), 157, 306; Beckerath, *Untersuchungen*, 255 (13 F), 62.

In the lacuna between *TC* XI, 17 and XI, 26, I would propose placing the kings Senakhtenreʿ, Seqenenreʿ Tao, Wadjkheperreʿ Kamose (and possibly others) as well as the total. The rulers named in the lower part of *TC* XI would thus be the kings of Ryholt's "Dyn. 17" (whom he believes to have been listed on a lost * twelfth column). Their separation from those named in the upper part of the column could have been motivated by this family's suggested provenance from Dendara and its struggle with the supplanted Inyotef family that continued until early Dyn. 18.[111]

Frag. 163 placed at the end of *TC* XI has a throne name ending in—*ḥ3b* in line 2 6, and another in line 31 might be constructed with *wbn*. A parallel can be found in *TC* VIII, 4 (*Sḥ3b-rʿ*) and *TC* VIII, 11 (*Wbn-rʿ*), whereas there are absolutely no corresponding throne names in Dyns. 17–19.[112]

What follows is a listing of *TC* X, 31–XI, 26 with the hypothetical restorations proposed above in the right column:

TC X, 31	- - -	Sekhemreʿ-neferkhaw Upuautemsaf ??
TC XI, 1	Sekhemreʿ-	Sementawy Djehuti
TC XI, 2	Sekhemreʿ-	Seusertawy Sobekhotep VIII
TC XI, 3	Sekhemreʿ-Se-	-ʿanchtawy Neferhotep III
TC XI, 4	Seʿankhenreʿ	Montuhotpi
TC XI, 5	Nebiriaw (I.) Sewadjenreʿ	
TC XI, 6	Nebiriaw (II.)	
TC XI, 7	Semenenreʿ	(proper name unknown; Sobek- ?)
TC XI, 8	Seweserenreʿ Bebiankh	
TC XI, 9	Sekhemreʿ-shedwaset (< tawy ?)	Sobekemsaf (I)
TC XI, 13		Sekhemreʿ-wadjkhaw Sobekemsaf II
TC XI, 10		Sekhemreʿ-upimaat ("the elder") Inyotef (VI)

(*continued on next page*)

Cf. also Beckerath's "Sesostris V". Improbable seems Weser[monthu] (?) (Beckerath, *Untersuchungen*, XIII, L).

[111] Helck (n. 95), 125–133; cf. the Coptos decree of Inyotef (VIII, according to the sequence presented here): E. Martin-Pardey, "Zum Koptosdekret Antefs V.", in: *FS Jürgen von Beckerath zum 70. Geburtstag am 19. Februar 1990* (Hildesheim: HÄB 30, 1990), 185–197.

[112] From late Dyn. 17 there is only a titulary prince *Sbk-m-ḥb* attested in Esna; and the consort *Sbk-m-ḥb* of a prince Ameni. The next ruler with a name (but not the throne name) ending with *-m-ḥb* is Horemhab.

table (*cont.*)

TC XI, 11		Sekhemreʿ-Herhermaat Inyotef (VII)
TC XI, 12		Nebukheperreʿ Inyotef (VIII)
TC XI, 14		Sekhemreʿ-wahkhaw Raʿhotep
TC XI, 15	[1]5 kings	
TC XI, 16	Weser . . . reʿ	Weserenreʿ
TC XI, 17	Weser-	Senwosret (IV) Seneferibreʿ
TC XI, 18		
TC XL, 19		[placing of the following kings uncertain]
TC XL, 20		Senakhtenreʿ
TC XL, 21		Seqenenreʿ Tao
TC XI, 22		Wadjkheperreʿ Kamose
TC XI, 23		(total)
TC XI, 24		
TC XI, 25		
TC XI, 26	. . . hab	

The lengths of the reigns are listed in the *TC* as follows: *TC* XI, 1: 3 years (rest lost); *TC* XI, 2: 16 years (rest lost); *TC* XI, 3: 1 year (rest lost); *TC* XI, 4: 1 year (rest lost); *TC* XI, 5: 26 years (rest lost); *TC* XI, 8: 12 years, *x* months, 12 days.[113] Of those rulers who are hypothetically arranged here among their successors, a regnal year 7 is attested for Sobekemsaf II, and for Inyotef VIII (Ryholt: Inyotef VII) Nebukheperreʿ a year 3. These eight kings produce a total of 69 years; for all 15 entries *TC* X, 31–XI,14 we might estimate 75–100 years.[114] For the kings placed from *TC* XI, 16 onward, there are good reasons for assigning them a significantly shorter length of rule. Kamose will have died not long after his regnal year 3 (attested on the Kamose Stela), at a time when Ahmose was still quite young.[115] As his mummy testifies, Seqenenreʿ suffered an early death on the battlefield. Ryholt postulates 4 regnal years for Seqenenreʿ, and one year for Senakhtenreʿ,[116] who is not recorded in contemporary documents. If Senwosret IV is

[113] Cf. Ryholt, *Situation*, 202.
[114] Cf.—with a different succession—the estimates by Ryholt, *Situation*, 204.
[115] For the coregency, cf. Ryholt, *Situation*, 273; otherwise, 172ff., 309.
[116] Ryholt, *Situation*, 206.

to be placed here, a first year is attested in a biographical inscription.[117] It follows that the rulers listed here were in power only very briefly; with a total of perhaps 15 years.

Despite various differences in the internal sequence of kings between Ryholt's version and that presented here, both reach a relatively reliable estimate of the length of time to be assigned to the rulers between Dyn. 13 and 18: roughly a century. Ryholt has 67 years ("Dyn. 16") + 31 years ("Dyn. 17"). According to our reading *TC* X, 31–XI, 14 covers 75–100 years, and *TC* XI, 16 to Kamose amounts to 15 years (cf. below, final remarks, section 6).

5. *Dynastie 15*

The kings of Dyn. 15, or the "Hyksos" (*Ḥḳ3.w-ḫ3s.wt*, "Rulers of Foreign Countries") were rulers of (at least remote) Syro-Palestinian descent whose power was based in the eastern Nile Delta where a high proportion of the population were of Palestinian origin. Establishing the relative chronology of this dynasty suffered from the inadequate documentation and the widely assumed discrepancy between the royal names in the epigraphic sources and the Manethonian tradition.[118] Previously, moving beyond the Khamudi attested in the *TC* and the epigraphically recorded kings involved deciding which of the many scarabs named kings of Dyn. 15 and which did not. Hitherto, there were no generally recognized criteria for the attributions. The distribution and frequency of their scarabs often seemed to favour including Sheshi and *Jaʿqubhaddu* ("*Jaqobher*") whereas Helck believed that "*Semqen*" and *ʿAnathaddu* ("*ʿAnather*") could be assigned a place among the "great Hyksos" (i.e. Dyn. 15 of the traditional approach). Ryholt proposed to include the *Skr-hr* now attested in Tell el-Daba and to consider, from the three rulers whose scarabs include the title *ḥq3-ḫ3swt*, *Smḳn* and *ʿpr-ʿnt* as the first two kings of Dyn. 15.[119] None of these names can be equated with the Hyksos names such as preserved by Manetho, and this alleged dis-

[117] W. Helck, *Historisch-biographische Texte der 2. Zwischenzeit und neue Texte der 18. Dynastie* (Wiesbaden: KÄT, 1983²), 41 [no. 56].

[118] For the history of the debate from 1936–1997, see in detail, Schneider, *Ausländer*, 58–70.

[119] Ryholt, *Situation*, 118–125. Moving the third—*ʿnt-hr*—to Dyn. 12 is apparently not correct, cf. Ben-Tor et al. (n. 3), 63.

crepancy seemed to indicate to most scholars that the Manethonian evidence has to be discarded despite of the close to complete lack of contemporary sources that might fill the gap. The situation was that summarized by W. A. Ward: "*It is impossible to equate the names preserved in the various recensions of Manetho with these actually known from the monuments (. . .) It is clear that most of the names preserved in this tradition are too corrupted to have any value (. . .) The present discussion will therefore ignore Manetho as being unreliable.*"[120]

This traditional standpoint relies on the improper assumption that even if most of the documentary evidence on the Hyksos is lost, we nevertheless possess at least all their names, and does not accurately reflect on how their names were handed down and copied in the later chronographical tradition. Instead of rejecting Manetho, the author has tried[121] to solve the issue by reckoning with kings absent from our contemporary documentation[122] and by accounting for textual mistakes in the process of the copying of the king lists by late scribes who could solely rely on the written form of the names but were not aware of their original sounding. Our correlation of the traditions does not leave any lacunae which must be filled having recourse to scarabs. The nearly complete loss of the sequence of Dy. 15 kings in *TC* (where only the last one, Khamudi is preserved) gives priority to Manetho of whose epitomists those can be shown to be correct that place *Apophis* at the end of the dynasty (Africanus, Eusebius's Armenian version, the scholion to Plato's Timaios). The names of this sequence—1. Salitis, 2. Bnon, 3. Apachnan, 4. Iannas, 5. Archles/Assis, 6. Apophis—can all be equated with names attested epigraphically with one exception for which a postulated original name can be supplied.[123] It has to be noted,

[120] W. A. Ward, "Royal-Name Scarabs", in: *Studies on Scarab Seals. Vol. II. Scarab Seals and their Contribution to History in the Early Second Millennium BC* (Warminster, 1984), 162. Similarly, M. Bietak, Historische und archäologische Einführung, in: *Pharaonen und Fremde. Dynastien im Dunkel. Sonderausstellung des Historischen Museums der Stadt Wien in Zusammenarbeit mit dem Ägyptologischen Institut der Universität Wien und dem Österreichischen Archäologischen Institut Kairo, Rathaus Wien, Volkshalle, 8. Sept.–23. Okt. 1994,* 17–57: 24.

[121] Schneider, Ausländer, 33–56.70–75.

[122] Striking examples are the two Hyksos *Śkr-Hr* (architrave found in Tell el-Daba and first published in 1994) and Khamudi (attested only in *TC*) who could not possibly have been postulated by modern research. A late tradition of *Śkr-Hr* seems to be preserved in pCarlsberg 642 where an impious ruler *Saker* is mentioned (cf. J. F. Quack, "Zwischen Sonne und Mond—Zeitrechnung im Alten Ägypten", in: H. Falk, ed., *Vom Herrscher zur Dynastie. Zum Wesen kontinuierlicher Zeitrechnung in Antike und Gegenwart,* Bremen 2002, 27–67: 47f), equated by Quack with Salitis, but *Śkr-Hr* is certainly preferable.

[123] For what follows see in detail Schneider, *Ausländer,* 50–56.

that the *TC* apparently once listed a total of 6 rulers of this dynasty, including one named Khamudi, the copyists of Manetho also name 6 rulers, but without Khamudi.[124]

Hieroglyphic:	Copyists of Manetho:	
a. Šarā-Dagan (*Šȝrk[n]*)	1. Salitis	> 36 years, 7 months
b. *Bin-ʿAnu	2. Bnōn	> 44 years
c. (ʾApaq-) Ḫajran	3. Apakhnan	> 19 years
d. Jinaśśiʾ-Ad	4. Iannas	> 50 years, 1 month
e. Sikru-Haddu[125]	5. Archlēs/Assis	> 49 years 2 months
f. Apapi	6. Apophis	> 61 years
6. Ḫālmuʾdi		– (not in Manetho)
Total *TC*: 108 years	Manetho: 260 years	

The total given at *TC* X, 21 for the entire Dyn. 15 is 108 years.[126] By contrast, according to Africanus's version of Manetho, the dynasty would have lasted 284 years. Assigning reign lengths to individual rulers is at the present possible only in some cases. Beckerath proposed a hypothetical reign for all individual rulers,[127] but this remains speculative since it is not clear which of the reigns have been lengthened by decades by Manetho and which not. On an unnumbered fragment of the TC (Ryholt's "b")[128] are the remains of the totals of two reigns: "10 (or 20, or 30)" + x years and "40" + x years. The latter could hypothetically be assigned to Apapi, who according to the colophon on the Rhind Mathematical Papyrus must have reigned at least 33 years. The first reign might then be assigned to *Śkr-Hr*.[129] Another reign length can be inferred from the note on the verso of the Rhind Mathematical

124 Cf. Schneider, *Ausländer*, 56 (if not in the name *Chamois* of the book of Sothis).

125 The interpretation of major elements of these names such as offered by Ryholt, *Situation*, 126ff. (particularly *ʿpr* and *hr*) reflects older positions (Albright) which are no longer supported.

126 See Ryholt, *Situation*, 118.—It must be noted at the outset, however, that in an unpublished communication made while this book was in its final stages of preparation, Ryholt announced that the traces on the actual papyrus did not confirm Gardiner's reading and that another date, possibly of more than 140 years should instead be considered possible (*editors' note*).

127 Beckerath, *Chronologie*, 137.

128 Ryholt, *Situation*, 118–119.

129 Contra Ryholt, *Situation*, 119.

Papyrus whereby in the 11th regnal year of the ruling king, Heliopolis has been conquered, and "he of the South" has attacked and taken Sile. Since "he of the South" must denote the Theban ruler Ahmose, the regnal year 11 can only be assigned to the successor of the Hyksos king Apapi: Khamudi.[130] The Hyksos capital Avaris will have fallen to Ahmose not much later. An inscribed spear point from the booty of Avaris which includes a dating criterion (orientation of the lunar hieroglyph)[131] enables us to place the conquest of Avaris in the regnal year 18/19 of Ahmose. A possible check is provided by a graffito in the quarry at Tura whereby "oxen from Palestine" were used at the opening of the quarry in Ahmose's regnal year 22.[132] The cattle could have been brought to Egypt after the three-year siege of south Palestinian Sharuhen, which followed the conquest of Avaris. This link between the reigns of Khamudi and Ahmose means that the beginning of Dyn. 15 should be 90 years before the death of Kamose (108 years—provided this number from the *TC* is correct—minus the 18 years of the reign of Ahmose parallel with the last two Hyksos).

6. *Total Length of the Period of Dyns. 13–17*

Providing any exact figure for the total duration of the period of Dyn. 13–17 is impossible. The difficulties are not merely due to the inadequacy of the documentation of the various dynasties, but rather that these are exacerbated by our inability to establish their mutual relationships. In particular, it is far from certain that Dyn. 15 and the Theban dynasty (Ryholt's "Dyns. 16/17") followed immediately on Dyn. 13 as Ryholt proposes, with both starting in 1649 BC. It seems plausible that the transition was both spatially and temporally more complex in the final decades of the 17th century. The fact that the numerous ephemeral rulers of the last 25 years or so of Dyn. 13 were probably incapable of maintaining administrative control of the entire country

[130] D. Franke, "Chronologie II", 263; M. Bietak, "Historische und archäologische Einführung", in: Bietak, *SCIEM 1996/1998*, 29; Beckerath, *Chronologie NR*, 115; Spalinger (n. 3), 299. Ryholt is opposed, but procedes a priori from a short reign for the last Hyksos king; likewise, Kitchen, "Regnal and Genealogical Data of Ancient Egypt," in: Bietak, *SCIEM 1996/1998*, 39–52, esp. 45–46 (who also considers assigning the date to the last Hyksos).

[131] Kitchen (n. 130), 46 correctly stresses that this criterion is not well founded.

[132] Franke, "Chronologie II", 264.

suggests that there may have been a number of competing local dynasties at the time.[133] It would be plausible to suppose that the origins of the power of these local dynasts lie in the period before the ephemeral end of Dyn. 13, and therefore that an approximate chronological fixpoint might be established at the end of the reign of Aya, at ca. 1650 BC.[134] This linkage between Dyns. 13 and 17 finds some support in biographical information of the time.[135]

Calculating back from the start of the reign of Ahmose (around 1539 BC) and suggesting that the Theban kings reigned for 90–115 years before Ahmose leads to a beginning of the Theban dynasty at ca. 1654/1629; based on the *TC*, the dates for Dyn. 15 would be 1639–1521 BC (cf. above). Given the uncertainties in the length of individual reigns here and in Dyn. 13, a conclusive judgment about the length of the SIP[136] still needs further evidence.

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[133] Spalinger (n. 3), 297–298 assumes that an independent kingdom (= Dyn. 17) already appeared a few decades before the end of Dyn. 13, and poses the question of the possible coexistence of a truncated state in the North with the Hyksos.

[134] Cf. still the remark of the Greek author Artapanos (2nd century BC), that under a king named "Chanephres" (Khaneferreʿ Sobekhotep IV), Egypt was divided into various kingdoms (Schneider, *Ausländer*, 158–159). Whether the pyramidion of Aya found at Faqus was removed there from Saqqara by the Hyksos, as Ryholt (*Situation*, 147) and Dodson (n. 3; 50) assume is not certain; Beckerath (*Untersuchungen*, 73) assumed the Ramesside era. Of the various possible synchronisations between the dynasties, Manetho's remark about a supposed conquest of Egypt by the Hyksos under a "Toutimaios", in whom one of the Dedumose kings of Dyn. 13 had earlier been suspected, is no longer tenable as the reference is clearly due to a misunderstanding of the *Vorlage*, or a textual error: cf. Schneider, *Ausländer*, 159; for a different interpretation, see A. Bülow-Jacobsen in: Ryholt, *Situation*, 327ff.

[135] The *stèle juridique* records that an Aya received the governorship of el-Kab in regnal year 1 of Merhotepreʿ Ini (successor of the king Aya) and that his grandson Kebsi sold it in regnal year 1 of Nebiriaw. In *TC* XI, 1–5, the lengths of the reigns up to Nebiriaw I are preserved (21 years, with a few months missing), so that including the reign of the founder of the dynasty in *TC* X, 31, some 25 years will have passed before regnal year 1 of Nebiriaw (cf. above, section 4). If the dynasty began between 1654 and 1629 BC, Merhotepreʿ Ini (cf. above, section 3) should be placed around a century after the start of the dynasty, i.e., ca. 1656 BC. This would result in 27–52 years for the period during which the father and grandfather of Kebsi exercised the office, which appears plausible. Ryholt (*Situation*, 197, 202) has a far larger margin of more than 70 years (1 Merhotepreʿ Ini = 1677 BC; 1 Nebiriaw I = 1627 BC), assuming that the father and grandfather of Kebsi reached a very ripe old age of more than 70 years each.

[136] Ryholt, *Situation*, 191 opts for a long, of 254 years (as R. Parker proposed based on his absolute dates for the MK), and thus proposes the dates of 1803–1549 (Dyn. 14 from 1805; Dyn. 15 to 1540; similarly Kitchen (n. 130), 46. For a short chronology cf. E. Hornung ("Lang oder Kurz?," in: *High, Middle, Low 1*, 36; 1756–1539 BC, with Dyn. 15 down to 1521. Dodson (n. 3, 50–51) also concludes that a maximum chronology is not necessary, but is willing lower the beginning of the NK to 1500 BC.

II. 8 THE NEW KINGDOM

Erik Hornung

For some time there has been a consensus about the relative chronology of the New Kingdom. Since most reign lengths are well documented, they are not problematic. Nor does the sequence of kings pose difficulties—except for Akhenaten's immediate successors (who are not mentioned in the cultic lists). However, the issue of coregencies for Thutmose III/Amenhotep II and Amenhotep III/Akhenaten continues to stimulate debate, as does the exact relationship between Amenmesses and Sety II, although otherwise dates important for relative chronology are particularly abundant for the Ramesside Period, leaving very little "empty space".

This positive situation is enhanced by the fact that regnal years were counted from a king's accession and appear in the dates of documents which allows precise calendar dates to be suggested for some reigns, the necessary first step leading to a "day-exact chronology" (Depuydt), as is in fact possible in the Late Period. The identification of the exact day of accession or the establishment of very precise possible limits allows additional checks through the months offered by Manetho via Josephus. A few problematic issues remain, especially the length of Haremhab's reign which has been estimated at between 13 and 27 years. In this particular case, additional criteria, such as the number of monuments or the sequence of officials cannot solve the problem.

Nor do we have Haremhab's mummy which could have provided a potential check based on his estimated age at death. But in fact, age estimates for royal mummies have not generally yielded satisfactory results. As Kitchen noted in his review of the basic work by Harris & Wente, their analyses offers an over-abundance of comparatively very young kings.[1] The cases of Thutmose III and Ramesses II are particularly revealing. The estimates provided by Wente and Harris for the ages of the unequivocally identified mummies of these kings (40 and 55 years, respectively) are glaringly at odds with the well-documented

[1] Harris & Wente, *Atlas*.

long reigns of both rulers (53 and 66 years). "Something somewhere is badly wrong", as Kitchen remarked.[2] In other cases, as with Amenhotep III, the identification of the mummy itself is not beyond doubt, which adds to the uncertainty.

The totals which the Manethonian sources cite include part of Dyn. 19 and thus provide only a limited control. For the period from ʿAhmose to Merneptah, Eusebius and the Old Chronicle give 348 years while Africanus has 263 years The tally resulting from the following list amounts to a minimum of 307 years and a maximum of 335 years for the same time span, effectively excluding Africanus' total.

Dyn. 18

ʿAhmose No data relating to the accession date is currently available. Most royal monuments are undated. Year 17 is cited on a stela from the foundations of the third pylon at Karnak (Abdul Qader Muhammad, *ASAE* 59, 1966, 148–149, pls. IV–V); year 18 is recorded on the stela Hanover 1935. 200. 209 (*Im Zeichen des Mondes*, Exhibition catalogue, Munich 1999, No. 4; A. Klug, *Königliche Stelen in der Zeit von Ahmose bis Amenophis III*, Brussels 2002, 49–51, reviving doubts about its authenticity), and year 22 in the Turah quarries (*Urk.* IV 25,7).

Josephus gives ʿAhmose a reign of 25 years, 4 months; Eusebius rounds this off to 25 years. (The figure is missing in Africanus.) The autobiography of an anonymous Viceroy of Nubia covers the period from ʿAhmose to Thutmose II (*Urk.* IV 39–41), and thus a maximum of 33 (21 + 12) years between the two rulers. For ʿAhmose, the minimum reign length should be 21 years and the maximum 25 full years. His mummy (*CG* 61057) was estimated to be that of a man 25–30 years old (Harris & Wente, *Atlas*, 202), but a general uncertainty prohibits drawing any conclusions.

The precise date of the defeat of the Hyksos and thus the end of Dyn. 15 must lie in ʿAhmose's second decade. "Year 11" in the Rhind Mathematical Papyrus should probably be assigned to the last Hyksos ruler Khamudi (A.-F. el-Sabbahy, *GM* 133, 1993, 97–99, cf. above Schneider, Chapter II. 7), but Kitchen still maintains that the date

[2] K. A. Kitchen, *JNES* 44 (1985), 235–237.

belongs to ʿAhmose (in SCIEM, 2000, 45). Since P. Rhind refers to the conquests of Heliopolis and Sile, the capture of Avaris could follow somewhat later.

Amenhotep I For the accession, W. Helck (in: *Fs S. Schott*, Wiesbaden 1968, 71–72) assumed that the festival dates and the months in Josephus indicated 29–30/I/ Akhet, as opposed to D. B. Redford (*JNES* 25, 1966, 115–116) who used the same festival dates to argue for 11/III/ Shemu while Krauss (*Sothis*, 115) considers the actual date of P. Ebers, 9/III/ Shemu, to be the accession date, as do U. Luft (*GM* 92, 1986, 69–77) and Beckerath (*Chronologie NR*, 110).[3] G. Vittmann believes the title "Royal Mother" borne by ʿAhmes Nefertari in the Turah inscription of year 22 (*Urk.* IV 25,4) supports a coregency; but he also stresses its chronological irrelevance, since Amenhotep I counted his regnal years from the death of his father ("Was there a coregency of Ahmose with Amenophis I?", *JEA* 60, 1974, 250–251).

Dated monuments belong to year 7 (graffito of the Viceroy Tury in Semna: J. H. Breasted, *AJSL* 25, 1908, 108), year 8 (Uronarti: *Urk.* IV 78,8; stela from Qasr Ibrim: J. Plumley, *JEA* 50, 1964, 4 with pl. I,3), year 9 (rock inscription in Semna: F. Hintze, *ZÄS* 111, 1984, 137–138 and Hintze & Reineke, *Felsinschriften*, No. 512), and 1/I/Shemu of year 10 (Kares Stela, *CG* 34003: *Urk.* IV 45,9). Thereafter there is only a graffito at Saqqara dated 19/IV/ Akhet of year 20 (*Step Pyramid I*, 79).

Josephus assigns ʿAhmose 20 years 7 months; the other Manethonian sources round this up to 21 years, which accords well with the 21 years that the "astronomer" Amenemhat spent (*jrj*) under Amenhotep I (L. Borchardt, *Altägyptische Zeitmessung*, Berlin & Leipzig 1920, pl. 18). Wente & Van Siclen argue that this refers only to sole rule and add 6 years coregency with ʿAhmose, but even this would not produce the 30 years necessary for a "real" *sed*-festival which they presume ("Chronology", 225). The accession date of Thutmose I means fixes the death date of ʿAhmose on 20/III/ Peret.

Thutmose I The accession on 21/III/ Peret is certain (*Urk.* IV 81,4). Further dates are 15/II/ Akhet year 2 (Tombos: *Urk.* IV 82,9), 22/I/ Shemu year 3 return from Nubia (*Urk.* IV 88,11; 89,6/16), year 4 on

[3] On the problems of the Ebers date, see below Chapter III. 10.

a naos from Giza (*Urk.* IV 91,9; perhaps posthumous or modern: R. Krauss, *Ä & L* 3, 1992, 86), and year 8/9 on a block from Karnak (A. Mariette, Karnak, Leipzig 1875, pl. 32.f), with doubtful attribution (see Wente & Van Siclen, "Chronology", 225–226, and R. Krauss, *Ä & L* 3, 1992, 86–87 with fig. 3). Perhaps the "11 years" on the stela of Nebwawy (*Urk.* IV 208,16) also refer to him, although D. B. Redford (*JNES* 25, 1966, 118–119) prefers Thutmose II.

With an estimated age of 18–22 years, the mummy (*CG* 61065) seems to be extremely young (Harris & Wente, *Atlas*, 202) for a reign of 12 years 9 months, according to Josephus.

Thutmose II Following Gardiner, Redford accepts 8/II/ Akhet (*JNES* 25, 1966, 117) as the accession date, whereas Beckerath (*Chronologie NR*, 117) assumes that it took place in III/IV Akhet, on account of the months assigned to his predecessor by Josephus. The only certain date is 9/II/ Akhet of year 1 (Aswan: *Urk.* IV 137, 9). A short reign is supported by the small number of scarabs (105 examples collected by B. Jaeger for Thutmoses II as opposed to 292 for Thutmoses I)[4] and gaps in the succession of officials, e.g. the stewards of Karnak, as well as the lack of a mortuary temple (signalled by L. Gabolde, "La chronologie du règne de Thoutmosis II", *SAK* 14, 1987, 61–81). However, Beckerath (*SAK* 17, 1990, 65–74; *Chronologie NR*, 121), W. Barta (*JEOL* 26, 1980, 33–34) and Wente & Van Siclen, "Chronologie", 226–227) have argued for a 13-year reign on the bases of the age of his children at the end of the reign,[5] the Ebers date, and the *sed*-festival of Hatshepsut, which is capable of different interpretations.

The "Year 18" which often appears in this context does not belong to Thutmose II but rather to Amenhotep II, according to L. Gabolde (*SAK* 14, 1987, 61–81), or to Maatkare Hatshepsut, according to Beckerath (*SAK* 17, 1990, 66, cf. R. Krauss, *Ä & L* 3, 1992, 86 with n. 3). The identification of the mummy (*CG* 61066) is uncertain and thus its age estimate of 25–30 years is not relevant. Manetho assigned "Chebron", who is generally identified as Thutmose II, 13 years, but this could easily be an extension of 10 years; 3 years fit the sources, but they are

[4] Cf. *Ä&L* 3 (1992), 88.

[5] On the problem of the expression "in the nest", cf. R. Krauss, *OLZ* 90 (1995), 239–240.

no more than a possibility. At present, we can assume perhaps 2 to 4 years for the reign of this king.

Hatschepsut When Hatshepsut seized power continues to be debated. The oracle of 29/II/ Peret year 2, initially postulated by Schott, is not sufficiently explicit (cf. Ch. Cannuyer, in: *Studies Lichtheim* I, 109–115). The queen counted her own years from her coregent's accession, so that Thutmose III's accession date is taken for hers, and confirmed through *Urk.* IV 367,3–5 on the creation of her obelisks in 7 months, from 1/II/ Peret year 15 to 30/IV/ Shemu year 16.

The first certain date is year 9 for the Punt expedition (*Urk.* IV 349,10). 12/III/ Peret year 12 in West Tangur (Hintze & Reineke, *Felsinschriften*, 172, No. 562) is linked to both kings, as is year 16 in Wadi Maghara (*Urk.* IV 393,15), as well as an inscription of the overseer of works Nakht in year 20[6] and a graffito at Saqqara of 2/III/ Peret year 20 (*Step Pyramid* I, 80, F). An inscription of 30/I/ Akhet year 17 in Karnak (*Urk.* IV 376,13) names Hatshepsut alone, and another of year 20 in Nubia (*Urk.* IV 1375,3) only Thutmose III. An ostracon of IV Peret year 20 from Deir el-Bahri should probably be assigned to Hatshepsut (W. C. Hayes, *JEA* 46, 1960, 38).

Thutmose III His accession occurred with certainty on 4/I/ Shemu (*Urk.* IV 180, 15–16). The earliest document thereafter is a graffito at Saqqara (Step Pyramid I, 80, D) which mentions a royal sojourn at Thebes for 5/IV/ Akhet of year 1. His sole rule could have begun on 10/II/ Peret year 22, recorded on a stela from Armant (*Urk.* IV 1244,14). Josephus gives Hatshepsut a reign of 21 years 9 months, which would cover her joint reign with Thutmose III. According to *Urk.* IV 895,16–17, Thutmose III died on 30/III/ Peret of his year 54. Before his sole rule, we have precise dates for a renewal of offerings in the Semna Temple on 8/II/ Shemu year 2 (*Urk.* IV 193,13), for the inauguration of the Vezier Useramun on 1/I/ Akhet year 5 (*Urk.* IV 1384,3), a mention of 26/II/ Akhet year 7 in the Akhmenu at Karnak (*Urk.* IV 1256,8), a renewal of offerings in Karnak on 27/I/ Shemu year 15 (*Urk.* IV 172,15); year 15 (without a royal name) is mentioned in the autobiography of Iamunedjeh (*Urk.* 940,5), year 16 in a rock inscrip-

[6] *Urk.* IV 1377,3.

tion at Abusir (Hintze & Reineke, *Felsinschriften*, 38 No. 64), and 16/IV/ Shemu year 18 at Shalfak (ibidem, 90 No. 365).

The stela of Senimes bears the date 25/III/ Peret year 21 (*Urk.* IV 1066,10). 25/IV/ Peret year 22 appears in the annals as the beginning of the first campaign (*Urk.* IV 647,12); the same year 22 also occurs in a reference to the restoration of a statue (*Urk.* IV 605,17). Dates from the Megiddo campaign include year 23, 4/I Shemu for arrival at Gaza (*Urk.* IV 648,9) and 16/I/ Shemu for the council of war at Yehem (IV 649,3ff.). Year 23 is also documented from the temple in Wadi Halfa (IV 806,11), and the Akhmenu at Karnak records 2/I/ Shemu of a "year after 23" (IV 1252, 11, cf. A. H. Gardiner, *JEA* 38, 1952, 9). On 30/II/ Peret year 24 a foundation ceremony in Karnak is mentioned (*Urk.* IV 836,2), and for year 24 also a list of tributes (IV 671,6). Year 25 occurs in the Botanical Garden in Karnak (IV 777,2) and on a stela at Serabit el-Khadim, Sinai (IV 886,5), year 27 on the statue of Sabastet (IV 1369,4), year 28 in the tomb TT 82 (IV 1043,15), year 29 in the annals for the fifth campaign (IV 685,3), and year 30 for the sixth campaign (IV 689,3).

3/I/ Shemu year 31 is mentioned in the list of booty for the seventh campaign (*Urk.* IV 690,14). An inscription of Sennefer at el-Bersheh (*Urk.* IV 597,12) cites 12/IV/ Shemu year 33 in relation to the *sed*-festival (a parallel inscription in Krakow gives 4/IV/ Shemu); year 33 is documented from the annals for the eighth campaign (*Urk.* IV 696,15), year 34 for the ninth campaign (*Urk.* IV 703,16), and year 35 for the tenth campaign (*Urk.* IV 709,15); year [38] can be restored for the thirteenth campaign (*Urk.* IV 716,12); year 39 for the fourteenth (*Urk.* IV 721,9) is also known from a graffito at Saqqara (13/III/?: *Step Pyramid* I, 80, E), and year 40 from a list of tribute (*Urk.* IV 668,4).

22?/I/ Akhet year 42 is documented with the restoration of a statue in Karnak (*Urk.* IV 606,6), year 42 at the end of the annals (IV 734,14); 2/II/ Peret year 43 is known from an ostracon from the west bank of Thebes (IV 1374,8), and year 45 from the dedication for a Mnevis-bull (IV 1373,2); 10/III/ Akhet year 47 is the date of the Gebel Barkal stela (IV 1228,6), year 47 of the Mnevis-bull stela Cairo *JdE* 65830 (M. Moursi, *SAK* 14, 1987, 233–235), and of the stela Berlin 1634 concerning an enclosure wall in the temple of Heliopolis (*Urk.* IV 832,12); 22/I/ Shemu year 50 is from a rock inscription at Sehel (*Urk.* IV 814,10; cf. also J. Leclant & G. Clerc, *Or* 61, 1992, 299). 14/II/Shemu year 51 is the date of a rock inscription at Ellesia (*Urk.* IV 811,10), and 23/III/ Peret year 53 is found on a scribal palette in Hanover (W. Helck, *MDAIK* 48, 1992, 41–44).

The reign length which Josephus associated with Amenhotep II is 30 years 10 months (reduced by ten years by Theophilus), and this could be identified as the sole rule of Thutmose III, if one assumes a coregency with his son, but might actually be Amenhotep III, if his reign length be reduced by ten years.

Amenhotep II The accession date (or the date when he was named coregent) was 1/IV/ Akhet (*Urk.* 1343,10). According to Bierbrier (*Or* 49, 1980, 108), who argues against a coregency, this is in error for 1/IV/ Peret. Many authors side with Redford (*JEA* 51, 1965, 107–122) and Parker (in *Studies in Honor of John A. Wilson*, Chicago 1969, 75–82), in favor of a coregency lasting 2 years 4 months. Despite P. Der Manuelian's lengthy discussion in his *Studies in the Reign of Amenophis II* (Hildesheim 1987), 19–40, the matter remains unresolved, cf. R. Krauss, *OLZ* 90, 1995, 241–242.

The earliest date is 15/III/ Shemu year 3 (Amada stela: *Urk.* IV 1289, 1) which, in the event of a coregency, might mark the beginning of sole rule. To year 4 belong an inscription from the Turah quarries (IV 1448,4), and an addition to the duplicate of the Amada stela in Cairo (IV 1299,2), as well as the 10/I/ Peret graffito at Saqqara (*Step Pyramid* I, 80, G). The years 5, 6, 7 and 9 are documented by several dates on stelae from Memphis and Karnak (*Urk.* IV 1301–1314), but there follows a gap until at least year 17 (uncertain: L. Habachi, *Kemi* 18, 1968, 55 with fig. 5 on the graffito of Nakht in Aswan) or even until 1/IV/ Akhet year 23, the date of the stela of the Viceroy Usersatet from Semna, in Boston (*Urk.* IV 1343,10).

A jar label from the mortuary temple names year 26 (*Urk.* IV 1365,18–20), which suits the 25 years 10 months of Josephus, but unfortunately, it is not certain that this figure belongs to Amenhotep II, although it makes no sense for Thutmose III either. No available information suggests a longer reign. Only the upper limit for the estimated age of the mummy (*CG* 61069; Harris & Wente, *Atlas*, 202) at 35–45 years can be reconciled with the historical data.

Thutmose IV There is no basis for determining the date of his accession, other than Josephus' figure of 8 months which suggests the end of II or beginning of III Akhet. On this assumption the date of the sphinx stela, 19/III/ Akhet year 1 (*Urk.* 1540,2) is plausibly the earliest of the reign. Somewhat later in the first year would be 7/II/ Shemu from a stela in Luxor (El Sayed Higazy & B. M. Bryan, "A New Stela of Thutmose IV from the Luxor Temple", *VA* 2, 1986, 93–100). Bryan

provides a list of documented years in the reign (*The Reign of Thutmose IV*, Baltimore & London 1991, 5–9.

An inscription on Sinai (*Urk* IV 1634,9) is dated to year 4, others to years 5 and 7 (IV 1564). A stela on the art market, probably from Medamud, names 10/I/ Shemu year 5 (R. G. Bigler & B. Geiger, "Eine Schenkungsstele Thutmosis' IV.", *ZÄS* 121, 1994, 11–17), two Theban tomb inscriptions (*LD Text* III, 273 and *Urk.* IV 1618,5) year 6; year 7 (to be corrected to 8) appears on a stela from the island of Konosso (IV 1555–1556). The highest date is 2/III/ Peret year 8 on the Konosso stela (IV 1545,6), when the king is informed about a Nubian rebellion.

Josephus gives "Thmosis" 9 years 8 months. The other Manethonian sources round down to 9 years and the Book of Sothis has an inflated 39 years. Years 9–10, like years 2 and 3, are not documented in contemporaneous sources. This seems acceptable, whereas a longer reign results in difficulties, and certainly the extreme lengthening proposed by Wente & Van Siclen on the basis of their ideas about sed-festivals is precluded. The age at death of his mummy (*CG* 61073) was estimated at 30–40 years (Harris & Wente, *Atlas*, 202; cf. Bryan, *Reign*, 9–13). According to the inscription on the Lateran obelisk (*Urk.* IV 1550,5), it lay "on its side for 35 years" before being erected, which would include the entire reign of Amenhotep II and an unknown number of the years of Thutmose III and IV.

Amenhotep III Based on the date of the first *sed*-festival, Helck (*Manetho*, 67) argued for an accession on 3/III/ Shemu. An inscription from III Shemu year 1 was found in el-Bersheh (*Urk.* IV 1677–1678); in year 2 the quarries at Turah were opened (*Urk.* IV 1681,2) and the commemorative scarab of the wild bull hunt was issued (*Urk.* IV 1739,1). A graffito in the royal tomb WV 22, at the passage into the antechamber, is dated to 7/III/ Akhet year 3 (J. Kondo, in: R. H. Wilkinson (ed.), *Valley of the Sun Kings*, Tucson 1995, 29–30, fig. 3); a wine jar label from Deir el-Medina also mentions year 3 (Valbelle, *Ouvriers*, 23). Several dates in year 5 are linked to the Nubian campaign: 24/II/ Akhet on the island of Sai (*Urk.* IV 1959,11), 2/III/ Akhet near Aswan (*Urk.* IV 1665,15), I Shemu at Buhen (*Urk.* IV 1758,17) and a stela at Konosso on the return from Kush (*Urk.* IV 1662,7). The lion-hunt commemorative scarab dates to year 10 (*Urk.* IV 1740,12), as does the scarab commemorating the wedding with Gilukhepa (*Urk.* IV 1738,6), and a graffito of 13/III/ Shemu at Saqqara (*Step Pyramid* I, 81, H).

The second decade of the reign is poorly documented. The series of commemorative scarabs ends with that relating to the excavation of a lake for Queen Teye, dated 1–16/III/ Akhet in year 11 (*Urk.* IV 1737,8). Labels on wine jars from Deir el-Medina document years 14, 17 and 19 (Valbelle, *Ouvriers*, 23); a papyrus fragment in Turin mentions IV Peret year 14 (*GLR* II 310, XI). For II Akhet year 20 the statue of Nebunefer in Brussels records a royal visit to Memphis (*Urk.* IV 1885,10), and 2/I/ Peret (without royal name) is documented in an historical inscription from the mortuary temple of Amenhotep-son-of-Hapu (A. Varille, *Inscriptions concernant l'architecte Amenhotep fils de Hapou*, Cairo 1968, 96–97).

The third decade is likewise sparsely documented. A jar-label from Amarna of year 21 should belong to this reign (*JEA* 67, 1981, 2), as should the dates of 20/III/ Shemu year 27 of P. Berlin 9784 (A. H. Gardiner, *ZÄS* 43, 1906, 28–35) and O. Cairo *CG* 25242 of 20/IV/ Akhet year 29. Many dates are associated with the first *sed*-festival in year 30, beginning on 27/II/ Shemu (Kheruef: *Urk.* IV 1867,2) and extending through III Shemu (*Urk.* IV 1869,2; 1837,9); these are supplemented with numerous labels from Malqata, some from year 29, but generally mentioning year 30 and the first *sed*-festival (W. C. Hayes, *JNES* 10, 1951, 35–56, 82–112, 156–183, 231–242, and additional labels in M. A. Leahy, *Excavations at Malkata and the Birket Habu 1971–1974. The Inscriptions*, Warminster 1978).

Further deliveries at Malqata are dated to year 31, along with the hieratic stela BM 138 with the decree for Amenhotep-son-of-Hapu (6/IV/ Akhet: Varille, *Inscriptions*, 67–85; D. Wildung, *Imhotep und Amenhotep*, Munich & Berlin 1977, § 182). A contract from Gurob is dated 5/I/ Akhet year 33 (P. Gurob II,1: A. H. Gardiner, *ZÄS* 43, 1906, 35–37), and the second *sed*-festival of year 34 is documented with numerous labels from Malqata (Hayes, in *JNES* 10, 1951). 1/I/ Shemu year 35 is the date of two stelae at Silsileh (*Urk.* IV 1920,3; 1678,8); the third *sed*-festival of year 36 is documented in the tomb of Kheruef (*Urk.* IV 1860,2–7), and 9/II/ Peret of year 36 on a Sinai stela (*Urk.* IV 1891,4). Labels from Molkata mention year 37 for the third *sed*-festival (*Urk.* IV 1954,12), stretching through 1/III/ Shemu of year 38 (Hayes, *JNES* 10, 1951, fig. 11, no. 142). So at least 37, and perhaps 38 full years should be assumed for Amenhotep III; Manetho's copyists give 38 years 7 months, as well as 36 and 37 years (Helck, Manetho, 67).

A long coregency with Akhenaten has been posited time and again since 1899 (Petrie, *A History of Egypt* II, London, 208), but it has been

challenged by W. Helck (*MIO* 2, 1954, 196–209), and many others, most recently by Gabolde, *Akhenaton*, 62–98, who discusses most of the arguments. Gardiner's remark years ago (*Egypt of the Pharaohs*, Oxford 1961, 213) still stands: "the much canvassed co-regency must be an illusion".

Amenhotep IV/Akhenaten Analysis of the sequence of dates on the later boundary stelae at Amarna, Akhenaten's newly founded capital, places the accession in the time span 1/I Peret—8/I Peret (see W. J. Murnane, "On the Accession Date of Akhenaten", in *Studies in Honor of George R. Hughes*, Chicago 1976, 163–167; Murnane & Van Siclen, *Stelae*, 155; Beckerath, *Or* 63, 1994, 123; Gabolde, *Akhenaton*, 14–16).

One of the earliest dates of the reign is the hieratic docket on the Amarna letter EA 27, from 5?/I/ Peret year 2 (*Urk.* IV 1995,16, cf. W. Fritz, *SAK* 18, 1991, 207–214). 27/?/Peret year 2 and epagomenal day 4 of year 3 are mentioned in P. Berlin 9784 (Murnane, *Texts*, 44), 7/II/ Akhet year 4 in P. Berlin 9785 (Murnane, *Texts*, 46), 11/III/ Akhet year 4 with the expedition of the High Priest May in the Wadi Hammamat (Murnane, *Texts*, 68), 19/III/ Peret year 5 in the letter of Ipi to the king (Murnane, *Texts*, 51). The earlier series of boundary stelae is dated 13/IV/ Peret year 5, the later series exactly a year later, with repetition of the oath on 8/I/ Peret year 8 and a colophon of 30/IV/ Akhet year 8 (Murnane & Van Siclen, *Stelae*, 73–86). There is a reference to "Year 9 of the heretic" in a letter from the reign of Ramesses II (P. Berlin 3040: *KRI* III 5).

The later years are less well documented in monumental inscriptions. 8/II/ Peret year 12 is mentioned in the tribute scenes in the tombs of Meryre and Huya (*Urk.* 2003,5; 2006,11); 20/III?/ Akhet year 12 is the date of the Nubian campaign on a stela in Buhen (Murnane, *Texts*, 101–102); 2?/II/ Peret year 14 of a graffito at Saqqara (J. Malek, *DE* 32, 1995, 105–106). Wine jar labels from the site of Amarna document Akhenaten's regnal years 4 through 17 (Hornung, *Untersuchungen*, 90–91; Krauss, *MDOG* 129, 1997, 227–229), so that he could have died at the earliest during the sealing of the wine jars in year 17 (II Akhet, corresponding to August 22 to September 20 [Julian] in 1336 BC) or just before the sealing in year 18 at the latest. Akhenaten does not seem to have been preserved in the Manethonian tradition. The conventional identification of ΩΡΟΣ (Horos) with Akhenaten is problematic.

*Smenkhkare*ʿ *and* ʿ*Ankh(et)kheperure*ʿ It is now certain that not only a man ʿAnkhkheprureʿ, but also a woman ʿAnkhetkheprureʿ ruled between Akhenaten and Tutʿankhamun. The king is first known as ʿAnkhkheprureʿ (throne name) Smenkhkareʿ *ḏsr-ḫprw* (personal name), later as ʿAnkhkheprureʿ mrjj /Neferkheprureʿ/Waenreʿ/and Nefernefruaton mrjj Waenreʿ. The two names of the queen, i.e. ʿAnkhetkheprureʿ mrjj/ Neferkheprureʿ/Waenreʿ/ and Nefernefruaton *ꜣḫt n hj.s*, are nearly the same as the king's later set of names and epitheta. The "funerary" epitheton *ꜣḫt n hj.s* (beneficial for her husband) is hers alone and indicates that she succeeded her husband ʿAnkhkheprureʿ. Her identity remains problematic; Kiya, Nefertiti, and Merytaton have been proposed. Items of her funerary equipment were adapted for Tutʿankhamun (M. Gabolde, *Égypte Afrique & Orient* 33, 2004, 19–26). Josephus lists three rulers named ΑΧΕΝΧΕΡΡΣΣ < ʿAnkh(et)kheprureʿ, i.e. two male rulers (one of which might be due to a corruption in the text) and a female, described as a king's daughter. In its transmitted form the Manethonian tradition ascribes 12 years and some months to either of the kings named Akhenkherres. Possibly the figures reflect an original 2 years and some months. The mummy of King ʿAnkhkheprureʿ is identifiable as the occupant of KV 55; his age at death was 18–22 years (W. J. Murnane, *OLZ* 96, 2001, 22).

The wine jar labels from Amarna attest sixteen successive wine vintages during the occupation of the site, 13 corresponding to years 5 through 17 of Akhenaten, whereas 3 vintages correspond to regnal years of his successors. The vintage of Akhenaten's year 4 occurred in the year before the foundation of the city; wine of year 4 was consumed at the site before the vintage of year 5 became available. Thus altogether seventeen successive vintages are attested at Amarna.

Up to year 13 of Akhenaten the chief vintners held the title *ḥrj kꜣmw*. The title *ḥrj bꜣḥ* is attested from year 13 through 17 and its use continued in year 1 and 2 of King ʿAnkhkheprureʿ. The last vintage that is documented at Amarna dates to a regnal year 1; in that year the vintner's title *ḥrj kꜣmw* was reintroduced and continued to be used as wine jar labels in the tomb of Tutʿankhamun show (see below). Regnal year 1 of the last vintage at Amarna could belong either to the queen ʿAnkhetkheprureʿ or to Tutʿankhamun. The only inscription from this period that is dated by a regnal year with a royal name is the graffito in the Theban tomb of Pairy: 10/III/Akhet year 3 of ʿAnkhkheprureʿ mrjj /// Nefernefruaton mrjj /// (*Urk*. IV 2024, 14). The date seems to relate to the king, but the queen is not excluded (Gabolde, *Akhenaton*,

161–162, 184). If the graffito relates to her, then she continued the year count of her husband and the last vintage that is attested at Amarna dates to year 1 of Tutʿankhamun. If the graffito relates to the king, then the queen started a regnal year count of her own; year 1 of the last vintage belongs to her and there would be no dated material of Tutʿankhamun at Amarna.

A regnal year 3 is also attested at Amarna in the labels on vessels for various commodities. Year 3 continues year 1 and 2 of King ʿAnkhkheprureʿ as labels of year 2 and 3 belonging to a single delivery of olive oil prove (Hornung, *Untersuchungen*, 88–89). There are only 3 wine jar labels of year 3 which cannot represent a complete vintage, because the yearly mean number of wine jar labels is 50 to 60. The disproportion is explicable if the change from regnal year 2 to 3 occurred during the sealing of the wine jars. Thus King ʿAnkhkheprureʿ would have counted his reign from a day in ca. II Akhet (Krauss, *MDOG* 129, 1997, 238), which may have coincided with the occurrence of Akhenaten's death.

Tutʿankhamun There are no plausible proposals for his accession date, nor by dated inscriptions for his first three years. A graffito at Saqqara is dated 2/IV/ Shemu year 4 (*Step Pyramid* I, 78); year 4 is also attested on a donation stela (W. Kaiser et al., *Ägyptisches Museum Berlin [1967] no. 776*); a label on a textile from his tomb cites year 6 (*Urk.* IV 2062,4); the decree for the Overseer of the Treasury Maya is dated 22/III/ Peret year 8 (Stela Liverpool E. 583: A. A. M. A. Amer, "Tutankhamun's Decree for the Chief Treasurer Maya", *RdE* 36, 1985, 17–20). Wine jar labels from the tomb document years 4, 5, 9 and 10 (J. Cerný, *Hieratic Inscriptions from the Tomb of Tutʿankhamun*, Oxford 1965, 1–3), but the last could also have been Akhenaten's (R. Krauss, *OLZ* 90, 1995, 245–246, and P. Tallet, *BIFAO* 96, 1996, 369–383).

Analysis of botanical remains from the funeral show that the burial took place in March/April, and thus the death in January, III or IV Peret (R. Krauss, "Nochmals die Bestattungszeit Tutanchamuns", *SAK* 23, 1996, 227–254). The age of the mummy was estimated at ca. 18 years (F. Filce Leek, *The Human Remains from the Tomb of Tutʿankhamun*, Oxford 1972).

Aya The death of Tutʿankhamun in III or IV Peret should date the accession of Aya. A wine jar label from Deir el-Medina mentions Aya's mortuary temple and a year 2 (*KRI* VII 65,9), but the date could belong

to Haremhab's reign. A donation stela of the king is dated to 1/III/ Shemu year 3 (*Urk.* IV 2109,8), and two others bear the date 1/IV/ Akhet year 4 (*Urk.* IV 2110,13), the highest date known, which accords well with Josephus' 4 years 1 month.

Haremhab The accession may have been in II Akhet, provided it was related to the king's participation in the Opet Festival (Hornung, *Untersuchungen*, 38–39). But the change of year from 26 to 27 in O. IFAO 1254 leads Krauss to conclude that the accession may be placed in the interval between 28/IV/ Peret and 13/I/ Shemu (*DE* 30, 1994, 73–85). However, it is not certain that these dates should be assigned to Haremhab.

Festival foundations of 22/IV/ Akhet year 1 are known from Karnak (*Urk.* IV 2132,4); the rewards of Neferhotep in TT 50 (*Urk.* IV 2177,6) date to year 3; 1/I /Akhet year 6 is attested on a stela from the mortuary temple of Amenhotep III (G. Haeny, BÄBA 11, 1981, 65–70); year 7 is mentioned in O. BM 5624 (IV 2162,10); and Maya's graffito in the tomb of Thutmose IV is dated in III Akhet year 8 (*Urk.* IV 2170,15). Helck compiled a number of additional dates from years 1 to 13 (*Ä & L* 3, 1992, 64), and the highest certain date at present is III Akhet year 13, in a wine jar label from Saqqara (Martin, *JEA* 65, 1979, 15; cf. Murnane, *Texts*, 107 C 2). Hari (*Horemhab*, 392) wanted to assign a year 20(?) in El Kab (Capart, *ASAE* 37, 1937, 10) to Haremhab. Krauss argues that O. IFAO 1254 supports a longer reign (*DE* 30, 1994, 73–85), and a longer reign is also favored by Beckerath (*SAK* 6, 1978, 43–49) and van Dijk (*GM* 148, 1995, 29–34: 15–17 years).

The interpretation of the graffito in the royal mortuary temple referring to the "day of entering of King Haremhab", dated to 9/I/ Shemu year 27, is contentious. Beckerath (*Tanis und Theben*, Glückstadt 1951, 104) argued that this was the date of death (better: burial); the use of the expression *jrjt ʿḳw n* with the meaning "burial" is occurs in the contemporaneous TT 50 (Hari, *La tombe thébaine du père divin Neferhotep*, Geneva 1985, pl. X), and *ʿḳw* is also used for the burial of the Apis-mothers (Smith, in Lloyd, ed., *Studies J. G. Griffiths*, London 1992, 203–204). Thus it seems legitimate to understand this date as a reference to the burial of Haremhab, which suggests that he died at the end of II Peret. O. IFAO 1254 also points to year 27, and this in turn is compatible, without any emendation, with the year 58 or 59 of the Mes inscription, including the reigns of all the proscribed kings of the Amarna Period.

Dyn. 19

With the exception of the relationship between Sety II and Amenmesses, the royal succession of this dynasty is not a matter of debate, and, excluding some minor details, the lengths of the various reigns are likewise relatively certain. Helck provided a list of the confirmed regnal years from Ramesses I to year 10 of Ramesses II (*Ä & L* 3, 1992, 64), and Wente & Van Siclen compiled another covering the time span from year 32 of Ramesses II through Ramesses X ("Chronology", 251–261). Kitchen's index (*KRI* VIII 70–84), supplemented by Helck, *Ostraka*, is more comprehensive for Ramesses I through Ramesses XI. However, as many dates are not linked to a royal name, assignment to particular reigns are subject to change. Demarée has supplied an overview of accession dates from Sety I through Ramesses XI (*GM* 137, 1993, 52).

The surviving portion of Manetho's list for the later phase of the dynasty is problematic since only Twosre's ("Thoeris") reign is correct at 7 years, including the coregency with Siptah and her sole rule. Africanus provides a total of 209 years, and Eusebius 194, but both are too high as the actual sum cannot be more than 104 years.

Ramesses I A possible date for his accession can be deduced using Sety I's accession date in combination with the months indicated by Josephus (neither of which is certain, however), resulting in III, or possibly IV Peret. On this basis, the only certain date of the reign, 20/II/ Peret year 2 on the stela Louvre C 57 from Buhen (*KRI* I 2,9), would lie at the end of the second year of the reign. The king may have died at the beginning of his third year, which would allow for two full years. (For dates from his reign see also Krauss, *DE* 30, 1994, 83, n. 13.) Josephus assigns him 1 year 4 months which Africanus rounds down to one year, allowing for an estimate of one or, alternatively, two years.

Sety I Utilizing the date of a later processional festival celebrating Sety I (*KRI* VI 249,7), Helck (*CdE* 41, 1966, 233–234; *SAK* 17, 1990, 207–208) and Krauss (*OLZ* 90, 1995, 246; *SAK* 24, 1997, 168) propose 24/III/ Shemu (cf. *KRI* VIII 70) for the accession. Basing his analysis on palace accounts in Memphis, Murnane identified a period between 18/III to 23/IV/ Shemu, and favored the festival date of 2/IV/ Shemu (*Serapis* 3, 1975–1976, 23–33). Using pRollin 1889 Redford (*King-Lists*, 113 with n. 46) chooses 23/IV/ Shemu, or the interval between 30/II/ Shemu

and 2/I/ Akhet, which is compatible with the festival date. For Brand (*The Monuments of Seti I*, Leiden 2000, 302), 24/III/ Shemu is "the most likely solution", but the date cannot be considered certain.

Analyzing the inscription of Bakenkhons, Bierbrier reckons the length of the reign at 15 years (*JEA* 58, 1972, 303), and Kitchen (*JNES* 39, 1980, 170–171; *High, Middle or Low* I, 3, and III, 153–154) concurs. However, Jansen-Winkeln argues (*JNES* 52, 1993, 221–225) that the autobiographical details of the high priest's career do not allow for such extrapolations. Spalinger suspects that 10 years and a fraction is more appropriate, given the data from the campaigns (*JARCE* 16, 1979, 41 n. 106). The abundance of sources for years 1–11 suggests that Sety I died in year 11; only year 10 is missing (*KRI* VIII 70), while 13/IV/ Shemu year 11 is known from Gebel Barkal (*KRI* I 75,8). The limited production of the Aswan quarries which were opened in year 9 (Brand, *JARCE* 34, 1997, 101–114) favors 11 years, as does the extended sum of 51 regnal years in Africanus (Josephus gives 59). After discussing the sources, Brand favors 11 full years, or perhaps 10 years (*Monuments of Seti I*, 305–309), and Kitchen now suggests 11–15 years (in SCIEM, 2000, 42–43).

Arguments for a coregency between Sety I and Ramesses II (Murnane, *Ancient Egyptian Coregencies*, Chicago 1977, 57–87, 183–185) have been criticized by Kitchen (*JNES* 39, 1980, 169–171), and Brand also comes to a negative conclusion (*Monuments of Seti I*, 312–332. Regardless, Ramesses II's regnal year count did not begin under Sety I. Clearly, the kings of the Ramesside period found a way for the designated successor to share in sovereignty other than using a titulary and separate dating system.

Ramesses II Helck suggested 27/III/ Shemu for the accession of Ramesses II (*AnBib* 12, 1959, 118–120); Krauss (*SAK* 5, 1977, 146–148), Valbelle (*Ouvriers*, 167) and Demarée (*GM* 137, 1993, 52) concur with this date which is that of a regularly documented festival. An alternative suggestion made by Larson and Wente & Van Siclen was countered by Helck (*SAK* 17, 1990, 205–207). After exhaustive discussion, both Beckerath (*Chronologie NR*, 68–70) and Brand (*Monuments of Sety I*, 302–305) agree with Helck and Krauss.

The king certainly ruled for 66 full years (66 years 2 months according to Josephus), and every year of his reign is documented (*KRI* VIII 70–73), with the highest date being 18/I/ Akhet of year 67 (*RAD* 30,10), soon followed by 19/II/ Akhet of a year 1 (*RAD* 30,14). There

is an indication that he died after 29/I/ Akhet (Valbelle, *Ouvriers*, 176 with n. 4).

Merenptah O. Cairo *CG* 25504 shows that the accession occurred between 19/I and 13/II/ Akhet. Peden ("A Note on the Accession Date of Merenptah", *GM* 140, 1994, 69) narrows this interval to 3–13/II/ Akhet, on the basis of a Theban graffito from 2/II/ Akhet year 1 (but cf. Krauss, *OLZ* 90, 1995, 246–247). Other options are 19/I/ Akhet (Demarée, *GM* 137, 1993, 52, opposed by Kitchen, *BiOr* 60, 2003, 586) and 5–7/II/ Akhet (Beckerath, *GM* 191, 2002, 5–6).

The highest date is IV/ Shemu year 9 (O. Gardiner 197: *KRI* IV 159,5). The report of his death reached Deir el Medina on 16/?/ Peret (HO 64,1,1); presumably he died during year 10. 7/IV/ Akhet year 10 is mentioned in P. Sallier I, 3,4 (*LEM* 79), and *KRI* IV 160 also assigns two Theban graffiti of 7 and 13/II/ Akhet year 10, announcing the inundation, to the reign of Merenptah. The 19 years 6 months given by Josephus can thus be reduced by a decade. Sety II was his immediate successor, without any intervening rule by Amenmesses (Krauss, *SAK* 24, 1997, 174–177).

Sety II Helck calculated that the accession took place between the end of I Peret and the beginning of III Peret (*AnBib* 12, 1959, 123). He is followed by Janssen (*Varia*, 101 with n. 21), whereas Krauss posits an interval of 29/II/ Peret through 3/III/ Peret (extended up to 6/III/ Peret by Beckerath, *Chronologie NR*, 71). For Demarée (*GM* 137, 1993, 52), it is 29/II/ Peret, announced on 16/?/ Peret in HO 64,1,1. According to O. Cairo *CG* 25560 (*KRI* IV 302), the king was in Thebes on 10/II/ Akhet year 1.

The king's death was reported in Thebes on 19/I/ Peret year 6 (O. Cairo *CG* 25515: *KRI* IV 322); O. *CG* 25516 from 17/I/ Peret is still dated to his reign (*KRI* IV 328). A graffito above the tomb of Twosre dates his burial to 11/III/ Peret in year 1 (of Siptah; Altenmüller, in Reeves, ed., *After Tutʿankhamun*, London & New York 1992, 148, fig. 19). The mummy (*CG* 61037) suggests that Sety II died young.

Amenmesses Janssen (*Varia*, 99–109), Krauss (*SAK* 24, 1997, 161–181) and Beckerath (*Chronologie NR*, 70–73) have recently discussed the relationship between the reigns of Amenmesses and Sety I. We know from HO 64,1 that the Foreman Neferhotep was absent from work after the accession of Sety II; thus his murder by "the enemy" can only have

taken place later if the enemy be identified with Amenmesses or, rather, his followers. The date of accession can be placed between 27/I/Shemu and 18/III/ Shemu (O. Cairo *CG* 25783 & 25784: *KRI* IV 227,6). He was in power in Thebes during years 3 and 4 (perhaps earlier in Nubia), which are unaccounted for in the dates of Sety II, but are followed by a great "clean-up" in Deir el-Medina by Sety II. Treating Amenmesses as a rival king provides the best explanation for the various phases in the decoration of Sety II's tomb, as pointed out by Dodson ("The Decorative Phases of the Tomb of Sethos II and their Historical Implications", *JEA* 85, 1999, 131–142), and also for the interruption of work in the tomb of Twosre (Altenmüller, in *After Tut'ankhamun*, 141–164, esp. 149, 159). The last date of the rival king is 29/III/ Shemu year 4 (O. Cairo *CG* 25784, 15—the only ostracon from this year!). Assigning ostraca from Deir el-Medina dated in years 1 and 2 to Amenmesses (so Helck, *Ostraka*, 97) cannot be justified.

Siptah Helck's suggestion that O. Cairo *CG* 25521 allows the accession to be placed between 28/IV/ Akhet and 3/I/ Peret (*AnBib* 12, 1959, 123–124) presumes a scribal error, but is supported by the year change in P. Greg between 28/IV/ Akhet and 11/I/ Peret (Janssen, *Varia*, 116, and Beckerath, *Chronologie NR*, 74). Following Helck (*Studies Kakosy*, 270), Demarée sets the date as 2/I/ Peret (*GM* 137, 1993, 52). Given the report of the death of Sety II on 19/I/ Peret (see supra), the accession must have taken place early in I Peret.

The execution of the "Chancellor" Bay was announced on 27/III/ Shemu year 5 (Grandet, *BIFAO* 100, 2000, 339–342); therefore he cannot have been buried on 22/IV/ Akhet in year 3, as Altenmüller suggested (*SAK* 23, 1996, 1–9, and *GM* 171, 1999, 13–18). This date (without year) is better linked to the burial of Siptah by the Vizier Hori (O. Cairo *CG* 25792: *KRI* IV 414–415). To year 6 belongs a graffito found in Buhen (*KRI* IV 365 [2]). Siptah died between 9 and 12/II/ Akhet and was buried on 22/IV/ Akhet year 7, according to Beckerath (*Chronologie NR*, 74, following Helck, in *Studies Kakosy*, 270). Alternatively, Krauss (*OLZ* 90, 1995, 247–248) and Schneider (*ZÄS* 130, 2003, 144, 146) suggest year 6.

Twosre Work in her tomb began in year 2 of Sety II (W. Helck, *SAK* 17, 1990, 208–210), but was interrupted for a time (see Amenmesses). After her debut as sole ruler, the queen counted her years as a continuation of the deceased Siptah's reign.

A graffito in Deir el-Bahri mentions a "visit" of Amun to the mortuary temple of the reigning pharaoh Twosre on 28/II/ Shemu year 7 (Marciniak, *Inscriptions*, 59–60, No. 3). A date 5/III/ Peret year 8 (O. Deir el-Medina 594: *KRI* IV 407,16) is assigned by Krauss (*SAK* 4, 1976, 191, and *OLZ* 90, 1995, 248 n. 29) to Merenptah's reign instead of hers. For IV [Peret?] of year 8 on O. Cairo 25293 see Altenmüller, *JEA* 68, 1982, 114 who suggests that she died in I Shemu year 8, which would correspond to the reign of 7 years recorded by the Manethonian copyists.

Dyn. 20

The ancient compilers who excerpted Manetho's history did not record any names for this dynasty, simply citing "12" (actually 10) kings who reigned for 135 (Africanus), 172 (Eusebius) or 178 years. Only Africanus' total could be correct, provided it follows directly on the sum down to Merneptah and so includes the last rulers of Dyn. 19. The actual length of the various reigns is both certain and precise, thanks to an abundance of dated documents. The only significant change resulting from recent scholarship is a shortening of the reign of Ramesses X. Parker assigned him 9 full years based on a presumed lunar date, whereas contemporaneous sources do not justify more than 3 years. Problems were also created by a hypothetical "interregnum" at the inception of the dynasty, but again, our sources preclude such a proposal; there is simply no space available.

Demarée (*GM* 137, 1993, 49–52) and Helck (*Ostraka*) have discussed the accession dates, which are in general clearly restricted. Documented regnal years are listed in *KRI* VIII.

Sethnakhte His accession date is not known, but Beckerath proposes the beginning of II Shemu (*Studies Kakosy*, 63–67; *Chronologie NR*, 75–76). Dates are only known from year 2, on 10/II and 24/III/ Shemu, but possibly also (without month) from year 3 on Sinai (Beckerath, *Studies Kakosy*, 63–67). He probably died on 25/I/ Shemu, at the start of his year 3 (Altenmüller, *GM* 145, 1995, 29–36). If his year count subsumes the sole rule of Twosre, he will have ruled for only a year; however, the graffiti Deir el-Bahri 3 and 10 are linked to the Festival of the Valley, and imply an interval of 10 years between year 7 of Twosre and year 7 of Ramesses III (Krauss, *Sothis*, 139), so that Sethnakhte must be assigned some 3 years.

Ramesses III His accession was on 26/I/ Shemu (Beckerath, *Chronologie NR*, 77, with n. 431). Every year of the reign is documented, except for the first, down through year 32. His death occurred on 14?/III/ Shemu year 32. The burial equipment was transported into the Valley of the Kings on 4/I/ Akhet, and the burial will have taken place on 24/I/ Akhet (O. Deir el-Medina 40: *KRI* VI 106, see Cerny, *ZÄS* 72, 1936, 113, and Helck, *Studies Kakosy*, 269). According to information provided by O. Chicago 12073 (Allam, *Ostraka*, No. 40, 73–76) 18 years elapsed between year 17 of Ramesses III and year 3 of Ramesses IV.

Ramesses IV His accession on 15/III/ Shemu is certain (O. Deir el-Medina 44); word reached the workers at Deir el-Medina on the following day (O. Deir el-Medina 39 and P. Turin 1949 + 1946), as the accession took place in Thebes. For the accession dates of Ramesses IV, V and VI see Janssen, *Varia*, ch. VIII. Dates extend to 23/III/ Akhet year 7 (O. Deir el-Medina 207: *KRI* VI 149), and the Turin Indictment Papyrus (*RAD* 80,8–9) indicates that Ramesses IV must have died before the harvest of his year 7, i.e., before May (Gregorian), probably in IV Peret. The estimated age of the mummy (*CG* 61041) was at least 50 years.

Ramesses V Beckerath calculated the accession at around 1/IV/ Peret (*ZÄS* 122, 1995, 98; *GM* 157, 1997, 7–10); Gutgesell (*Die Datierung der Ostraka und Papyri*, Hildesheim 1983, 227–229), followed by Helck (*Ostraka*, 411), prefers 29/III/ Peret, and Janssen (*GM* 155, 1996, 62) tries to set the date between 29/IV/ Peret and 7/I/ Shemu, but this remains uncertain. Recently, Beckerath put the accession before I Peret (*GM* 188, 2002, 16–17), supported by Demarée's new interpretation of P. Turin 2044.

O. Cairo *CG* 25247 (without royal name) documents 25/II to 17/IV/ Shemu of year 4; a year 5 is not attested. The accession date of his successor indicates that he will have died between the middle of I Peret and the start of II Peret of his year 4. His mummy (*CG* 61042) shows him to be the victim of a smallpox epidemic, who was probably just over 30 years of age (Harris & Weeks, *X-raying the Pharaohs*, London 1973, 166–167). Krauss assigns him a reign of 3 years 10 months (*OLZ* 90, 1995, 249).

Ramesses VI His accession can be restricted to between 28/I and 11/II Peret (Beckerath, *GM* 79, 1984, 7, based on O. IFAO 1425); arguments for 8/II/ Peret are given by Janssen (*Varia*, 131–138). The

announcement followed on ?/II/ Peret (*KRI* VI 36 4). The highest date of the reign is 11/II/ Peret year 8 (Janssen, "Year 8 of Ramesses VI Attested", *GM* 29, 1978, 45–46), and a reign of 7 years 9 months can be deduced from Theban graffito 1860a (Krauss, *OLZ* 90, 1995, 249).

The earlier literature reflects confusion about the sequence (and thus names, numbers, dates and chronology) of the next two kings, but it is now clear that Ramesses VII (Itiamun) preceded Ramesses VIII (Sethherkhepeshef).

Ramesses VII. (Itiamun) Suggestions for the accession date vary widely: from between 20/II/ Peret and 5/II/ Shemu (Janssen, *JEA* 52, 1966, 92), to between 30/III and 26/IV/ Peret (Beckerath, *ZÄS* 122, 1995, 99; but *idem*, *Chronologie NR*, 85: on 30/III or 1/IV/ Peret), between 10/III and 26/IV/ Peret (Janssen, *GM* 155, 1996, 61), and "shortly after" 14/IV/ Peret (Demarée, *GM* 137, 1993, 52). Utilizing P. Amiens and other documents, Beckerath recently proposed 30/III/ Peret (*GM* 188, 2002, 17). Year 7 is documented in P. Turin 1907/1908 (*KRI* VI 403–409) and O. Strasbourg H 84 with 16/II/ Shemu (Janssen, *JEA* 52, 1966, 91 n. 2). While Eyre argues for a 25/IV/ Shemu year 8 (P. Turin 1883 + 2095: "The reign-length of Ramesses VII", *JEA* 66, 1980, 168–170), Valbelle suggests that the king in question may actually be Ramesses IX (*Ouvriers*, 39 with n. 8 and 204).

Ramesses VIII The accession date has been fixed between 2/I/ Peret and 13/I/ Akhet (Amer, *GM* 49, 1981, 9–12) and, according to Beckerath (in: *Deir el-Medina in the third millenium AD*, Leiden 2000, 4–5), must lie before 13/I/ Akhet. Only year 1 is documented, but the calendar provides a basis for arguing a year 2 if he reigned a full year, as his death must have occurred on 20/I/ Akhet because of the accession date of his successor.

Ramesses IX His accession probably occured on 21/I/ Akhet (Beckerath, *GM* 79, 1984, 7–8), but in any case on or after 18/I/ Akhet (Beckerath, *ZÄS* 127, 2000, 112; Janssen, *GM* 191, 2002, 59–65). He died in his year 19 with III and IV Akhet documented (Botti, *JEA* 14, 1928, 48–51, without royal name), and Beckerath suggests more precisely the end of I Peret (*ZÄS* 127, 2000, 112).

Ramesses X The accession was between 25 and 27/I/ Peret (Beckerath, *GM* 79, 1984, 8–9, based on Turin Cat. 2075 + fragm. = *KRI* VI 653,

and *ZÄS* 127, 2000, 112, followed by Valbelle, *Ouvriers*, 43, n. 3, and Demarée, *GM* 137, 1993, 50). IV Akhet year 3 is documented in the Giornale, followed by 24/I/ Akhet year 1 (Helck, *GM* 70, 1984, 32). Krauss allows for a year 4 (*GM* 70, 1984, 42–43), but a year 8 proposed by Bierbrier (*JEA* 61, 1975, 251) is quite uncertain, and Parker's astronomical arguments for 9 full regnal years can be discarded (Krauss, *Sothis*, 151–154, and Jansen-Winkeln, *ZÄS* 119, 1992, 32–33).

Ramesses XI According to Helck (*SAK* 17, 1990, 211–212), his accession date was 27 or 28/IV/ Shemu, but 20/III/ Shemu according to Gardiner (*JEA* 26, 1940, 23–29) and others (Cannuyer, *Studies Lichtheim* I, 98–105; Ohlhafer, *GM* 135, 1993, 59–72; Demarée, *GM* 137, 1993, 50), but not between 26/III/ Shemu and the 4th epagomenal day (Beckerath, *OLZ* 85, 1990, 657 n. 1). His year 27 is documented (8?/IV/ Shemu: *KRI* VI 701,15). The Renaissance (*wḥm-mswt-*) era counted 10 years and thus lasted into his 28th year (25/I/ Shemu year 10 in the letter BM 10326 = LRL no. 9). This means that a 29–year reign as given in the Book of Sôthis is possible. Dates from the Renaissance era are listed by Thijs, *GM* 173, 1999, 190–191. Years of this era are to be correlated with the regnal years of Ramesses XI and do not accord with calendar years (Ohlhafer, *GM* 135, 1993, 59–72). Thijs' proposal that Ramesses IX–XI were contemporary (*GM* 167, 170, 173; *SAK* 31, 2003, 289–306) has been countered by Beckerath (*ZÄS* 127, 2000, 114–116, and *GM* 181, 2001, 17).

II. 9 RELATIVE CHRONOLOGY OF DYN. 21

Karl Jansen-Winkeln

At the beginning of Dyn. 21 Egypt was split in two, with two centres of power, each ruled individually. UE, whose northern frontier was located in the region of Herakleopolis, was governed by a military commander who, at the same time was HPA of Thebes.[1] In texts and depictions some of these UE regents (Herihor, Pinudjem I and Menkheperre) assume in varying degrees attributes which are reserved for a king. Kings reigned in LE, but at least two of them (Psusennes and Amenemope) occasionally bear the title of "HPA". Contemporaneous documents of which only a small number survived do not give any direct indication as to the reason for this partition of Egypt.[2] The only large group of finds are the graves of the kings in Tanis and the collective interments in the Theban necropolis (including replacements and re-interments of older mummies). Among these Theban funeral sites various dated objects can be found, but unfortunately most dates are anonymous and not ascribed to any explicit regent. Of this twofold line of regents, Manetho lists only the kings of LE, namely (1) Smendes, (2) Psusennes [I], (3) Nepherkheres, (4) Amenophthis, (5) Osochor, (6) Psinaches, (7) Psusennes [II]. Contemporary documents contain ample reference of the kings Psusennes (*Pꜣ-sbꜣ-ḫꜥj-m-nwt;* only in LE), Amenemope (*Jmn-m-Jpt*) and Siamun (*Zꜣ-Jmn*) (both in LE and UE). The first two kings can be straightforwardly identified as Manetho's Psusennes (I) and Amenophthis. A king named Smendes (*Ns-bꜣ-nb-ddt*) is attested by only a few, undated inscriptions, but the history of Wenamun shows clearly that he was a contemporary of Herihor and thus the first king of Dyn. 21. The identification of the remaining four kings, on the other hand, has caused some problems.

The Nepherkheres of Manetho is not attested as the personal name of any king. Two bow caps from the grave goods of Psusennes I dis-

[1] The first two rulers also called themselves Viceroys of Nubia; the first three had the title Vizier.

[2] For an attempted explanation, see K. Jansen-Winkeln, *Orientalia* 70 (2001), 153–182.

play the throne-name and the personal name of Psusennes opposite the throne-name *Nfr-kꜣ-Rʿ (ḥqꜣ Wꜣst)* and the personal name *Mrjj-Jmn Jmn-m-njswt*.[3] Obviously the throne-name *Nfr-kꜣ-Rʿ* has been handed down as Nepherkheres by Manetho. The proper name Amenemnisut (*Jmn-m-njswt*) is attested only a second time on the relief Berlin 23673 from the reign of Shoshenq V, on which a long line of ancestors of the owner is named, sometimes together with the reigning king. On this relief, Amenemnisut is the predecessor of Psusennes I, whereas Manetho names him as the successor. His true position has not yet been identified. The Berlin genealogy was compiled only about 250–300 years after the reign of Amenemnisut and should, therefore, be given greater consideration than Manetho's frequently garbled tradition. But the fact that Psusennes and Amenemnisut appear together on one funeral object, strengthens the idea that Amenemnisut was the successor of Psusennes and that he donated the object.[4] Nevertheless, Amenemnisut (Nepherkheres) was without question an ephemeral king.

The Osochor of Manetho is attested contemporarily only by one inscription from Karnak, which registers the inauguration of a priest in year 2 of a king with the throne-name *ʿꜣ-ḫpr-Rʿ Stp.n-Rʿ* (the personal name is missing in a lacuna).[5] E. Young has demonstrated[6] that this king cannot be Psusennes I, as believed in the past, because he always bears the epithet *Stp.n-Jmn*. Furthermore, a few lines further down, the text refers to the inauguration of the priest's son in the year 17 of Siamun. If *ʿꜣ-ḫpr-ʿꜣ Stp.n-Rʿ* really were identical with Psusennes I, then the inaugurations of father and son had to have been almost three generations apart. Therefore this otherwise unknown throne-name from Dyn. 21 may well be that of Manetho's Osochor. In this case the second inauguration would have taken place only 21 years, or about one generation, later, if Manetho's 6 years for Osochor be accepted.

Actually, the personal name of the king is mentioned once, but not contemporarily.[7] An inscription (no longer traceable) from the roof of

[3] Montet, *Tanis* II, 105; 108, Fig. 44; pl. 72 (No. 413/414).

[4] See also Kitchen, *TIP*, 70–71. An alternative to this could be that the bow was made during a co-regency of the two kings, cf. *TIP*, 70–71 and Beckerath, *Chronologie*, 101. However the reign of Nepherkheres only lasted for a few years, and a co-regency is more likely at the end of a long reign. For the Berlin genealogy see Bochardt, *Mittel*, 96–112; Bl. 2/2a.

[5] No. 3B of the "Annals of the Priests", see G. Legrain, *RT* 22 (1900), 53; Kruchten, *Annales*, pl. 2; 17.

[6] *JARCE* 2 (1963), 100–101.

[7] Concerning the following see J. Yoyotte, *BSFE* 77–78 (1976/77), 39–54; cf. also Kitchen, *TIP*, § 437.

the temple of Khonsu from year 9 of Takelot III[8] mentions, among the author's ancestors, a king Osorkon and his mother *Mḥjt-m-wsḫt*. This Osorkon cannot be identical with one of the kings named Osorkon from Dyns. 22–23, because their mothers had different names.[9] A king's mother called *Mḥjt-m-wsḫt* is known from Dyn. 21; on the stela of *Pꜣ-sn-Ḥr* from the Serapeum the grandmother of Shoshenq I is named likewise.[10] The two texts complement each other optimally and indicate the existence of a king Osorkon in Dyn. 21, the uncle of the later Shoshenq I, who can be identified as Manetho's Osochor. They also match in time: Psusennes II, father-in-law of Osorkon I, is assumed to have been a contemporary of Shoshenq I. Because "Osochor"[11] was the older brother of Shoshenq I's father, he might well have been the second predecessor of Psusennes II.[12] The identification of Manetho's Osochor by Young and Yoyotte has gained general acceptance.

Manetho's last king but one, Psin(n)aches, cannot be found in any Egyptian sources whatever. The only name that could be considered (with some modifications), would be *Pꜣ-sbꜣ-ḫꜥj-m-nwt*,[13] but that name has already, and rightly so, been identified as Psusennes. On the other hand, contemporary documents reveal a King Siamun (*Zꜣ-Jmn*) bearing the throne-name *Nṯrj-ḫpr-Rꜥ* as the last but one king of Dyn. 21, who does not appear in Manetho's history. It is tempting, therefore, to identify Manetho's Psinaches with Siamun,[14] even though the lengths of their reigns do not match: Manetho's Psinaches is supposed to have reigned for nine years, Siamun, by contrast, for at least 17 years. A solution would be to amend the number 9 to <1>9. This identification and emendation have become traditional, as the most obvious. Anyway, we should always bear in mind that this identification originates only

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[8] *LD*, III, 258c; G. Daressy, *RT* 18 (1896), 51–52.

[9] Nor can Osorkon III and IV be considered, for chronological reasons.

[10] See *CSSM*, 30–31; Kitchen, *TIP*, § 85.

[11] This form of the Egyptian-Libyan word *Ws(j)rkn* ("Osorkon") is attested elsewhere in Manetho.

[12] F. Payraudeau, "Remarques sur l'identité du premier et du dernier Osorkon", *GM* 178 (2000), 75–80, is of the opinion that two objects of a king *ꜥꜣ-ḫpr-Rꜥ stp.n-Jmn Mrj-Jmn Wsjrkn*, which until now have been ascribed to Osorkon IV (whose throne-name is unknown), originally belonged to Osochor. If this is correct, Osochor would have taken turns using the epithets *stp.n-Rꜥ* and *stp.n-Jmn* in his throne-name.

[13] Cf. M. Römer, *GM* 114 (1990), 94.

[14] Cf., most recently, J.v. Beckerath, *GM* 130 (1992), 17–19 and (concerning a possible explanation for the varying information in Manetho's work) *GM* 131 (1992), 11.

from the fact that we can neither find a king from the end of Dyn. 21 who is named in contemporaneous documents in Manetho's work, nor can we find Manetho's last but one king Psinaches on Egyptian monuments. The remaining two criteria for the identification have not been met: neither name nor length of reign being the same.

The identification of Manetho's second king called Psusennes with a *(Ḥr-) Pꜣ-sbꜣ-ḫꜥj-m-nwt* is, on the one hand, unequivocal and undisputed. On the other hand, however, there is the question as to whether the last king of Dyn. 21 is identical with the last HP of Thebes of that dynasty who has the same name.[15] Actually, the evidence weighs heavily in favour of his being one and the same man, who was first HP and then successor to King Siamun in Tanis, without giving up his Theban office.

The only reference for the HP Psusennes can be found on shrouds and mummy-braces (etc.) from the priests' mummies in the so-called second Cachette (Bab el-Gusus).[16] From 10 references, 8 name him HP, whereas on the other 2[17] his name appears in a cartouche. No other titles are mentioned, which for H. Kees meant that he—in contrast to his predecessors—no longer possessed military power.[18] But this conclusion was perhaps overly hasty, because the HP Menkheperre, who held the highest offices,[19] is referred to on mummy wrappings from the second Cachette as only a HP,[20] his name otherwise appearing in a cartouche;[21] his military titles are not mentioned at all, and in the filiations of his descendants his name is often cited without any titles.[22] It can be established that the HP Psusennes' name is sometimes written in a cartouche like the names of Herihor, Pinudjem (I) and Menkheperre, whilst his father and predecessor Pinudjem II never used any royal

[15] In Kitchen, *TIP* they are distinguished from one another as Psusennes II (= the king) and III (= the HP).

[16] Burials A.17; 43; 48; 58; 65; 66; 125; 132; 133; 148, see G. Daressy, *ASAE* 8 (1907), 23–37.

[17] A.58 and 66, see Daressy (n. 16).

[18] H. Kees, *Die Hohenpriester des Amun von Karnak von Herihor bis zum Ende der Äthiopenzeit* (Leiden: PÄ 4, 1964), 79: "In contrast to all of his predecessors in Thebes he did not style himself supreme commander of the UE army."

[19] Cf. M. Römer, *Gottes- und Priesterherrschaft am Ende des Neuen Reiches* (Wiesbaden: ÄUAT 21, 1994), 66–73.

[20] Burials A.2; 13; 96; 105; 109; 113, see Daresssy (n. 16), 22–31.

[21] A.11 and 64, Daressy (n. 16), 22; 27.

[22] A.12; 26; 32; 38; 81 (Daressy [n. 16], 22–28) and elsewhere.

attributes. A graffito from the Temple of Abydos[23] reveals the complete titles of a king *Tjt-ḫpr-Rꜥ Stp.n-Rꜥ Pꜣ-sbꜣ-ḫꜥj-(m-)nwt Mrjj-Jmn,* who is simultaneously HPA and supreme military commander. Actually, the elements of the titles of his kingship, his duties as HP and his military titles blend into each other in a peculiar manner, not to be found elsewhere. He is called

njswt-bjt nb tꜣwj Tjt-ḫpr-Rꜥ Stp.n-Rꜥ <mrjj>(?) Jmn-Rꜥ njswt nṯrw[24]
ḥm-nṯr tpj n Jmn-Rꜥ njswt nṯrw
zꜣ Rꜥ nb ḫꜥw
ḥꜣwtj Pꜣ-sbꜣ-ḫꜥj-(m-)nwt Mrjj-Jmn ntj (r-)ḥꜣt nꜣ mšꜥ[w n Kmt ḏrw]
ḥm-nṯr tpj n Jmn-Rꜥ njswt nṯrw
jrj hpw nfrw n Kmt
ḥꜣwtj pr-ꜥꜣ Pꜣ-sbꜣ-ḫꜥj-(m-)nwt Mrjj-Jmn.

The military title, *ḥꜣwtj pr-ꜥꜣ Pꜣ-sbꜣ-ḫꜥj-(m-)nwt ntj (r-)ḥꜣt nꜣ mšꜥ[w n Kmt ḏrw],* is very informative. It reveals distinctly that this is the HP Psusennes, the successor of Pinudjem II, and not a king who has adopted the additional title of HP (as Psusennes I and Amenemope did). The reason is that this title is only to be found in connection with Theban HP and military commanders,[25] but never in connection with a Tanite king. The throne-name of Psusennes in this graffito also appears with slight variation (*Tjt-ḫprw-Rꜥ*) on a vessel fragment from Abydos.[26] A king bearing almost the same name, *Tjt-ḫpr-Rꜥ Stp.n-Rꜥ Mrjj-Jmn Ḥr-Pꜣ-sbꜣ-ḫꜥj-m-nwt,* can be found outside Abydos on two Theban statues: (1) Cairo CG 42192, on which he is named as an ancestor of his grandson *Mꜣꜥ-ḫpr-Rꜥ Stp.n-Rꜥ Mrjj-Jmn Ššnq* (Shoshenq II);[27] (2) the Nile-statue London BM 8 of that particular grandson which also mentions the

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[23] M. A. Murray, *The Osireion at Abydos* (London, 1989), 36; pl. XXI; G. Daressy, *RT* 21 (1899), 9–10.

[24] Concerning this epithet, cf. M.-A. Bonhême, *Les noms royaux dans l'Egypte de la Troisième Période Intermédiaire* (Cairo: BdE 98, 1987), 61.

[25] See *GM* 99 (1987), 19. No. 8 is to be crossed out of this list, see JEA 81 (1995), 130; instead, the HP *Jwlt* is attested a second time on an altar-stand in Moscow, see S. Hodjash & O. Berlev, *The Egyptian Reliefs and Stelae in the Pushkin Museum of Fine Arts, Moscow* (Leningrad, 1982), 157/161 (No. 105).

[26] E. Amélineau, *Les nouvelles fouilles d'Abydos 1897–1898* (Paris, 1904), 146 (24).

[27] Shoshenq II donated the statue, and not Schoschenq I, as often reported; cf. J.v. Beckerath, *Orientalia* 63 (1994), 84–87 and K. Jansen-Winkeln, *JEA* 81 (1995), 145–148, who both render the text.

daughter of Psusennes and mother of Shoshenq II, *Mꜣꜥt-kꜣ-Rꜥ*.[28] The additional *Ḥr(-Pꜣ-sbꜣ-ḫꜥj-m-nwt)*[29] is not a distinctive feature, but appears with reference to one and the same person[30] as demonstrated by the Decree for Maatkare.[31] Here the very same Psusennes and father of Maatkare is solely called *Mrj-Jmn Pꜣ-sbꜣ-ḫꜥj-m-nwt*. The obvious conclusion is that all these cartouches refer to the same person.[32] The graffito from Abydos also demonstrates that he was king and at the same time HP in Thebes; he had clearly not resigned this office.[33] He was probably buried in Tanis (and later re-buried in the Antechamber of the tomb of Psusennes I).[34] A limestone-fragment with his name has been found near Tell el-Daba.[35]

Dodson drew the conclusion that Psusennes did not have a reign of his own at all, but was only an UE ephemeral King next to Shoshenq I,[36] from the fact that many of his attestations are posthumous and that he is often mentioned together with Shoshenq I.[37] This is not at all convincing: on CG 42194 and BM 8 he is only mentioned in his grandson's genealogy, and together with Shoshenq I he only appears in the tomb TT A.18.[38] By contrast the latter inscription provides

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[28] C. R. Lepsius, *Auswahl der wichtigsten Urkunden des Aegypischen Alterthums* (Leipzig, 1842), pl. XV.

[29] Another reference is an inscription on a bead of unknown provenance, see *GLR* III, 300 (IV). The ivory stick-handle, which in Gauthier's opinion also belonged to Psusennes II (*GLR* III, 302[IV]), more probably belonged to Psusennes I.

[30] In contrast to Bonhême (n. 24), 60, who inexplicably would like to recognize up to four different persons in *Tjt-ḫpr-Rʿ (Ḥr-)Pꜣ-sbꜣ-ḫꜥj-m-nwt*; cf. also J. Yoyotte, *BSFFT* 1 (1988), 46(1).

[31] J. Winand, *Cahiers de Karnak* XI (2003), 672ff.; 707 (Fig.4), l.3, 5.

[32] Beckerath's distinction (*GM* 130 [1992], 18) between a Tanite king (Hor-) Psusennes with the throne-name *Tjt-ḫprw-Rʿ Stp.n-Rʿ* and a HP who, in the role of a (mock-) king (on the graffito in Abydos) bore the throne-name *Tjt-ḫprw-Rʿ Stp.n-Jmn* is not correct. The epithet is *Stp.n-Rʿ* in this graffito, too. Furthermore he is also called *Tjt-ḫprw-Rʿ Stp.n-Rʿ* on a vessel fragment from Abydos (n. 26, above) which cannot be connected to any other Psusennes than the one from the graffito.

[33] It is inexplicable why Beckerath (GM 130, 1992, 18) writes that if the HP Psusennes had inherited the crown from Siamun he would have had to appoint a new HP. A HP's and a king's office do not exclude each other in dynasty XXI.

[34] Cf. Yoyotte (n. 30), 41–53; idem, *Tanis, L'or des pharaons*. Exhibition-catalogue (Paris, 1987), 136–137.

[35] M. Bietak, *Avaris and Piramesse: Archaeological Exploration in the Eastern Nile Delta* (Oxford, 1981), 271; but cf. LÄ V, 131.

[36] *RdE* 38 (1987), 49–54; *BES* 14 (2000), 9–12.

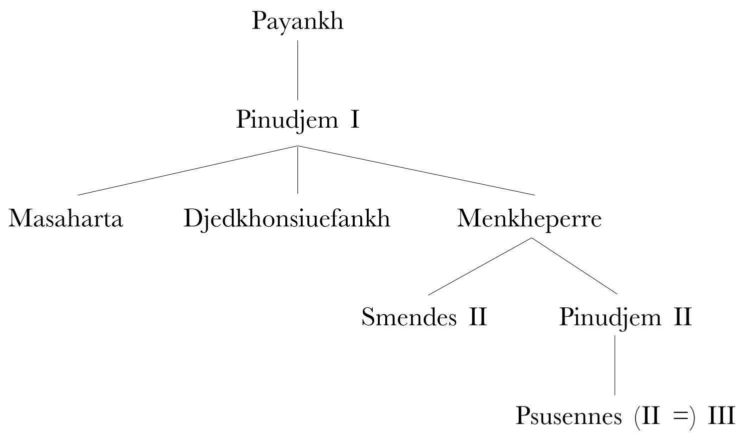
[37] The statues Cairo *CG* 42192; CG 42194 (name destroyed), London BM 8 and the Decree for Maatkare.

[38] A. Dodson, *JEA* 79 (1993, 267–268; pl. 28. On Cairo *CG* 42192, on the other hand, Psusennes does not appear together with Shoshenq I, but with another king called Shoshenq, see above, footnote 27.

weighty evidence that Shoshenq I was Psusennes's successor: someone is promoted by Psusennes (*sḫntj.f*), and is promoted once again during the reign of Shoshenq (*wḥm ḫntj.f*). There is no reference that the two kings reigned in parallel. Considering the fact that Psusennes II was buried in Tanis and appears in Manetho's list of kings, we cannot say that he was only an UE ephemeral king.[39]

There is thus evidence of the following LE kings in Dyn. 21: (1) Smendes, (2/3) Psusennes/Amenemnisut (Nepherkheres), (4) Amenemope, (5) Osorkon ("the Elder", Osochor), (6) Siamun ("Psinaches" in Manetho's work) and (7) Psusennes II (at the same time HP in Thebes). We do not know much about the familial relationships of these kings. There is nothing to be said about the origin of Amenemnisut, Amenemope and Siamun. Smendes I's wife, Tentamun,[40] is mother of Henuttawy, wife of Pinudjem I and mother of Psusennes I.[41] Consequently Smendes I would be father-in-law of Pinudjem I and grandfather of his successor(?) Psusennes I. Osochor, being son of Nimlot I and of *Mḥjt-m-wsḫt*, is uncle of Shoshenq I. Psusennes II is son of HP Pinudjem II and father-in-law of Osorkon I; the latter already concerns the relationship to the kings of Dyn. 22.

Nine UE rulers are known as belonging to Dyn. 21. Eight of them are part of a lineage of fathers and sons:



[39] Cf. also Beckerath, *GM* 130 (1992), 17f; Kitchen, *TIP*^{3} 1995, XIX–XXI.

[40] Herself being the daughter of a man without any important titles, called Nebseni.

[41] Under the probable circumstance that the King's Mother who is mentioned on some funerary objects, Henuttawi is identical with Pinudjem's wife. Kitchen's postu-

Only Herihor does not belong to this lineage;[42] his position as a predecessor or successor of Payankh is the only one disputed (see below). The order of the others is clear, even though some overlap. There is evidence of the HP (and king) Pinudjem I until a year 15, and of his son Masaharta in the years 16 and 18 following. His son Menkheperre who is clearly younger takes up the duties of the HP in a year 25 and from then holds office for almost five decades. A third son of Pinudjem I, called Djedkhonsiuefankh, is recorded only once as a HP on a coffin which is at present missing;[43] he most probably held office for a very short time between Masaharta and Menkheperre.[44] However, Pinudjem survived his son's term of office and died in that of Menkheperre (see below). Evidence of Smendes II is, admittedly, somewhat better than that of Djedkhonsiuefankh, but his term of office can only have been very short, either as Menkheperre's successor or as his "co-regent" (see below). His brother Pinudjem II came next in office, followed by his own son Psusennes, who is probably identical with King Psusennes II (see above). Consequently we have the following order: (1/2) Payankh and Herihor (see below), (3) Pinudjem I, (4) Masaharta, (5) Djedkhonsiuefankh, (6) Menkheperre, (7) Smendes II, (8) Pinudjem II, (9) Psusennes III.

Some of the UE regents are related by blood or marriage to those of LE: Smendes I seems to be the father-in-law of Pinudjem I, Pinudjem himself is Psusennes I's father (see above). HP Psusennes himself becomes king in Tanis.

Concerning the succession of the first two HP, Herihor was on account of a copying error believed for a long time to be father and predecessor of Payankh. Since this error has been corrected,[45]

late of a second (older) Henuttawi "Q" as a hypothetical second wife of Smendes and Psusennes' mother is only rooted in his wish for a genealogical bridge to the Ramessides for Psusennes on account of his occasionally being called "Ramses-Psusennes". This has only confused matters unnecessarily.

[42] Depending on whether he was predecessor or successor of Payankh, he might have been his father-in-law (Kitchen, *TIP*² § 438) or son-in-law (K. Jansen-Winkeln, *ZÄS* 119 [1992], 25) or he might have married his wife after Payankh died (J. Taylor, in: Eyre, *Proceedings*, 1143–1155).

[43] Kitchen, *TIP* § 392.

[44] We cannot totally exclude the possibility that he was a predecessor of Masaharta's who was in office only for a short period. According to A. Niwinski (*BES* 6, 1984, 83–6) he was a son of Pinudjem II; Torr's filiation data would in consequence not name his father but his great-grandfather (!) Pinudjem I.

[45] Cf. E. F. Wente, *(Fs Korostovtsev) Drevny Vostok* (Moscow, 1975), 36–38; *The Temple of Khonsu. I.* OIP 100 (1979), p. 13(d); pl. 26, l. 4.

the succession has had to be explained by other means. The term of office of both HP or at least part of it can be said to have taken place in the later years of the reign of Ramses XI. Records mention Herihor's years 5 and 6 (without any explicit relation), and Payankh's year 7 of the *wḥm-mswt*-era and a year 10. At first sight it would be logical if Herihor had held office in the first half of the *wḥm-mswt*-era and Payankh in the second. Even so, a series of arguments favour a reverse order:[46] (1) The form of the titles: We can recognise Payankh's origin from the rank of officers much more clearly than that of Herihor. He is mostly referred to simply as "The General", his military titles being much more prominent and detailed than those of Herihor. His titles are in general similar to those of Pinhasi, who was in charge of UE from the beginning of the *wḥm-mswt*-era. The titles of Herihor on the other hand are more related to those of the later HP. Furthermore, Payankh's titles almost always refer to the king (. . . *n pr-ʿ3*), as was usual in the Ramesside period, whereas those of Herihor no longer do so. (2) Payankh never assumes any royal titles or attributes, whereas Herihor and the later HP do. (3) Herihor and Pinudjem I are both recorded as builders in Thebes, and Pinudjem directly succeeds Herihor with regard to the decoration of the temple of Khonsu. Payankh on the other hand is not recorded as a builder. A similar situation is to be found regarding the (re-)burials in the Theban necropolis. On shrouds, bandages etc. of these mummies, every single HP of Dyn. 21 is recorded, except Payankh. Thus these burials must have taken place after his term of office. (4) The genealogical information corresponds more to a Payankh-Herihor succession. The order of these HP is still being discussed,[47] but in my opinion the order Payankh-Herihor is the more probable solution. At any rate, this problem has a direct influence on the chronology of the whole dynasty.

Most of the dates preserved from Dyn. 21 are from Thebes, and most do not refer to a specific ruler. Breasted presupposed that all

[46] *ZÄS* 119 (1992), 22–25.

[47] The following authors do not agree with the thesis published in *ZÄS* 119 naming Herihor as Payankh's predecessor: A. Niwinski, *BIFAO* 95 (1995), 346–47; J.v. Beckerath, in: D. Kessler & R. Schulz, eds., *Gedenkschrift für Winfried Barta* (Frankfurt: MÄU 4, 1995), 49–53; A. Gnirs, *Militär und Gesellschaft* (Heidelberg: SAGA 17, 1996), 199–201; Kitchen, *TIP*³ 1995, XIV–XIX (A–N). For a response see K. Jansen-Winkeln, *GM* 157 (1997), 49–74. In favour of the succession Payankh—Herihor are A. Egberts (*GM* 160 [1997], 23–25; *ZÄS* 125 [1998], 93–108) and J. Taylor (see above, footnote 42).

those dates were related to the LE kings[48] and in recent times this opinion has found general acceptance. The opinion is supported by some explicit dates which almost always mention the name of a Tanite King: There is a date which is explicitly related to Amenemope,[49] another one is related to Osochor,[50] and six are related to Siamun.[51] Furthermore Amenemope and Siamun are quite well documented in Thebes. On the other hand there is only one date which is explicitly related to a HP.[52] Under that condition, the following years would be recorded:[53]

Wḥm-mswt-era: 4; 5; 6; 7; 10
Smendes I: 1; 4(?); 6; 9; 10; 11; 12; 13; 15; 16; 18; 19; 20; 21; 25
Amenemnisut: –
Psusennes I: 6; 7; 8; 19; 27;[54] 30; 40; 48; 49
Amenemope: 1; 3; <u>5</u>; 10(?)[55]
Osochor: <u>2</u>
Siamun: 1; 2; 3; 5; 6; 7; <u>8</u>; 9; <u>10</u>; 12; 14; <u>16</u>; <u>17</u>
Psusennes II: 5; 13(?)[56]

The currently recorded dates can be made compatible in this order with Manetho's lengths of reign as preserved by Africanus. He gives Smendes 26 years, Nepherkheres (Amenemnisut) 4, Psusennes 46 (41 according to Eusebius), Amenemope 9, Osochor 6, Psinaches (that means Siamun [?]) 9 and Psusennes (II) 14 (35 according to Eusebius). At the end of Psusennes I's reign there was supposedly a co-regency with Amenemope. On condition that this dating system was used, the famous linen-bandage with the inscription "King Amenemope; year 49" can be restored beyond doubt to "[year X under] King Amenemope; year 49 [under King Psusennes; linen made by HP NN . . .]",

[48] *BAR* IV, § 604–607.
[49] Kitchen, *TIP* § 388, no. 54.
[50] Kitchen, *TIP* § 388, no. 56.
[51] Kitchen, *TIP* § 389, no. 73; 74; 77; 82 (from LE); 83; 84.
[52] Kitchen, *TIP* § 387, no. 46. This latter record must be interpreted differently if we adhere to a continuing dating by LE kings, cf. e.g., E. Young, *JARCE* 2 (1963), 102–103, n. 21; Kitchen, *TIP* § 377.
[53] With reference to the evidence listed in Kitchen, *TIP* § 379–381. Only the underlined dates are connected explicitly with the king.
[54] A. Dodson & J. J. Janssen, *JEA* 75 (1989), 128, 134.
[55] This date may also refer to Siamun, cf. Kitchen, *TIP* § 388, no. 55.
[56] Possibly referring to Shoshenq I, cf. Kitchen, *TIP* § 391, no. 86; 87.

the juxtaposition of the years being evidence of a co-regency.[57] As a result, Amenemnisut must have been the predecessor of Psusennes, and the only contemporary record of this king would indicate a co-regency Amenemnisut—Psusennes[58] at the beginning of Psusennes I's reign. Various suppositions have been made concerning the length of these two (hypothetical) co-regencies,[59] almost all of them deriving from Manetho's information: Only 46 of the 49 recorded years were to be taken into consideration.

On the other hand, in the case of Psinaches/Siamun, Manetho has to be emended. Siamun's attested 17 years mandates the emendation 9 > 19 (θ > ιθ). Altogether Dyn. 21 would have lasted 124 years which is the result of adding the lengths of reign according to Africanus and this emendation. The difference between these 124 years and Manetho's sum of 130 years (indicated in all versions, regardless of the actual, correct total) might be explained by suggesting that Manetho calculated those years in which there was a co-regency for both rulers.[60] According to this hypothesis, the lengths of reign for the UE rulers would be as follows:

Herihor until year 6 (or 7) of the *wḥm-mswt*-era;
Payankh from year 6 (or 7) until year 1 of Smendes I at most;
Pinudjem at the earliest from year 10 of the *wḥm-mswt*-era onward, until year 15 (year 16 at most) of Smendes I in his position as HP, after that at least until year 8 of Psusennes I as king;
Masaharta from year 16 (15 at the earliest) until year 25 of Smendes I as a HP at the latest;
Djedkhonsiufankh only for a very brief period between Masaharta and Menkheperre;
Menkheperre from year 25 of Smendes I until (at least) year 48 of Psusennes I.
Smendes II for a brief period between Menkheperre and Pinudjem II;
Pinudjem II from year 1 of Amenemope or shortly thereafter;[61]
Psusennes "III" from year 10 of Siamun on.

If, however—which seems probable—Payankh is not the successor but the predecessor of Herihor, this system cannot easily be maintained.

[57] Kitchen, *TIP* § 29.
[58] See above, footnote 4 and Kitchen, *TIP* § 56.
[59] Cf. for example Kitchen, *TIP* § 29, 465 (table I) or Beckerath, *Chronologie*, 101–102.
[60] Cf. Beckerath, *Chronologie*, 101–102; idem (n. 47), 54–55.
[61] Kitchen, *TIP* § 388 (51).

The highest recorded date for Herihor is a year 6, 15/III/*Peret*.[62] This date could only refer to Smendes if Herihor followed Payankh and if the dates refer exclusively to the LE kings. But Pinudjem was already recorded in year 6, 7/III/*Peret* (of Smendes after this system). The above given dating-system could only be retained if Herihor's date was to be read 7/III/*Akhet*[63] instead of 7/III/*Peret* (or emended accordingly), but that would be an unhappy solution.

Even so, there is some information for Theban dates of the UE kings. There is a record of a year 48 of HP Menkheperre;[64] moreover, a closer look reveals a complementary distribution of the records concerning the rulers of that time. In the first half of Dyn. 21, HP Herihor, Pinudjem I[65] and Menkheperre have royal attributes and titles to differing extents. On the other hand, the LE kings of that time are virtually not recorded at all in UE: there is a graffito mentioning Smendes[66] and a rock-stela,[67] and nothing for Amenemnisut and Psusennes I, even though the latter reigned for a long time. Subsequently, however, Amenemope and Siamun are well documented in Thebes, and Osochor at least once, whereas HP Pinudjem II (who held office parallel to them), does not adopt any royal attributes or titles. It is, therefore, likely that the HP who called themselves kings counted their own years of reign whereas during the second half of the dynasty the dates refer to the LE kings. This would mean that the beginning of Amenemope's reign might have implied a change in the dating-system and concurrently a change in the political structures.[68]

A possible, but very hypothetical explanation would be that a new family or a new branch of the same family gained power in Tanis and

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[62] Kitchen, *TIP* § 379, no. 3

[63] Cf. *ZÄS* 119, 26; Beckerath (n. 47), 51.

[64] Kitchen, *TIP* § 387, no. 46.

[65] This does not, of course, apply to Masaharta and Djedkhonsiuefankh since their period is equal to that of Pinudjem I.

[66] A. Varille, *Karnak(-Nord)* I (Cairo 1943), 36, Fig. 26, pl. 98 (71); L. A. Christophe. *Karnak-Nord* III (Cairo 1951), 77.

[67] G. Daressy, *RT* 10 (1888), 135f. Already in Daressy's time part of the text was gone; in the meantime everything has been destroyed. The genre of the text (*Königsnovelle*) normally requires a date, but the structure of the text does not require a date in that part which was already missing in Daressy's time.

[68] P. Brooklyn 16.205 might contain some information with regard to a critical situation in UE, referring to a year 49 of Dyn. 21 as a "bad time" (*ḥ3w bjn*); concerning the dating of the papyrus to Dyn. 21, see J.v. Beckerath, *GM* 140 (1994), 15–17; Kitchen, *TIP*[3], XXVI (Y).

then successfully laid claim to supremacy over the whole of Egypt. We know that Smendes and Psusennes I were closely related to the UE family of HP (see above). No family relationships whatsoever are known for Amenemope and Siamun, but Osochor, who held office between them, was a son of the Libyan great chief of the Meshwesh, Shoshenq A, and the uncle of the later Shoshenq I. We do not know if this family was in any way related to the descendants of Payankh, although it is possible that Amenemope, Osochor and Siamun all belonged to this family, or to a branch of it. It is also striking that HP Pinudjem II, son of Menkheperre is not only called his son (*zꜣ Mn-ḫpr-Rꜥ*), but also, sometimes even on the same object, the son (= descendant) of King Psusennes (I).[69] Thus it seems to have been important to stress his being part of this half of the royal family. A change of royal family with Amenemope could explain a change within the dating-system.

Assuming that the UE regents Herihor, Pinudjem I and Menkheperre counted their own regnal years, we can draw some conclusions. For the period of the LE kings Smendes I, Amenemnisut[70] and Psusennes I just one single date would have been recorded in Egyptian sources, and even that from later times: Year 19 of a king Psusennes is mentioned in retrospect on a stela from the Dakhla Oasis dated to year five of Shoshenq (I).[71] Under these conditions only the regnal years as given by Manetho could be used as evidence for the dates of these kings—which is precisely what scholars have done.

Uncertainty prevents us from precisely calculating regnal years for the first three UE rulers. Herihor reigned for at least 5 whole years (year 6 is recorded), possibly slightly longer (up to 8 years). In year 25 of Pinudjem, his son Menkheperre was installed as HP,[72] and soon after that a new count of years begins.[73] As a result we have to calculate at

[69] Daressy (n. 16), 23 (no. 24); 27 (no. 61); 28 (no. 81, no. 82); 31 (no. 113); 32 (no. 119, 120); 36 (no. 139).

[70] If the linen-band with the regnal year 49 (cf. above) is not to be associated with Psusennes but rather with Menkheperre, there is no need to propose a co-regency for Psusennes and Amenemope. As a result, the question of whether Amenemnisut was predecessor or successor of Psusennes reappears (see above, footnote 4.

[71] A. H. Gardiner, *JEA* 19 (1933), 32; pl. VI, l.11. Concerning the dating see H. Jacquet-Gordon, in: *Hommages à la mémoire de Serge Sauneron* I (Cairo: BdE 81/1, 1979), 180–182; O. Kaper, *BACE* 12 (2001), 77, n. 6; R. Krauss, *DE* 62 (2005), 43–48.

[72] "Banishment Stela," l. 1–8, see J.v. Beckerath, *RdE* 20 (1968), 10.

[73] In line 7/8 of the Banishment Stela a lower date follows (*RdE* 20, 10–11; 33). The two events described in the text should not lie too far apart from each other.

least 24 years for Pinudjem, at most 25 years. The highest date recorded for Menkheperre is the year 49 and in that year (his last?) Amenemope may have already reigned in Tanis.[74]

At first sight this seems to be contradicted by the fact that Smendes II, son of Menkheperre would have had to be HP at the latest when Psusennes I died,[75] because he donated goods for the burial. For this reason he cannot have been Menkheperre's successor if the reign of Menkheperre overlaps with that of Amenemope and even less so if Amenemnisut was Psusennes's successor. Niwinski presumed that Smendes II was only HPA in Tanis at that time, later becoming Menkheperre's successor for a short time.[76] This is possible, but in my opinion it is more probable that Smendes—like Masaharta previously—held office parallel to his father at the end of his father's reign, while the counting of regnal years continued to follow Menkheperre's reign. However that may be, 48 years is the most likely calculation for Menkheperre.[77]

Consequently, the first three UE rulers could be reckoned to have held office for at least roughly as long as the LE kings, namely 77 years (5 + 24 + 48), possibly 1 or 2 years less, if the overlap between Menkheperre and Amenemope is greater. A slightly longer period seems to be more probable, including some leeway for Herihor, altogether perhaps 80 years, hardly significantly longer. In other words, the dates we have from Manetho's tradition, 124 years (the sum of the lengths of reign according to Africanus with emendation 9 to 19 for Psinaches) and 130 years (sum total in all versions), set the limits of what is possible. Most likely is a total of about 126–8 years. If there is a difference in the lengths of the reigns of the HP Herihor, Pinudjem I

The lower date is probably the first year of Menkheperre, who grants an amnesty on New Year, which is an appropriate act at the beginning of a reign. Thus the event would mark the transition from Pinudjem to Menkheperre, not only the inauguration of a new HP under the royal authority of Pinudjem which would have been implied by the other dating-system.

[74] The linen-band with the inscription "[Year X under] King Amenemope; Year 49 [under NN]" (see above) under this circumstance would contain a common date of Amenemope and the HP Menkheperre.

[75] Cf. Kitchen, *TIP* § 25.

[76] A. Niwinski, *JARCE* 16 (1979), 59–60; idem, *21st dynasty Coffins from Thebes* (Mainz: Theben 5, 1988), 50–51 (§ 43).

[77] Less only if the overlap with the era of Amenemope lasted longer. But if the "bad time" for year 49 (footnote 68) is connected with the change of regency to Amenemope, year 49 of Menkheperre could be the same as year 1 of Amenemope.

and Menkheperre and the parallel reigning LE kings (from the reign of Amenemope onwards there is no difference in the two dating-systems anyway) it would only amount to a few years. And we do not know if Smendes and Herihor started their reign at the same time or whether the Manethonian numbers are all correct.[78]

At the beginning of Dyn. 22 there is a certain fixed point which links Dyn. 21 to absolute chronology, i.e. Shoshenq I's campaign in Palestine. According to the OT,[79] the Egyptian King Shishak besieged Jerusalem in year 5 of Rehabeam, king of Judah. On the Egyptian side, the campaign is attested by a victory scene in Karnak. Year 5 of Rehabeam can be pinned down to about 926/925 BC with the aid of the known lengths of reign of the kings of Israel and Judah and their synchronisms—although there are some inconsistencies—as well as by means of two synchronisms with the Assyrian chronology.[80]

From Egyptian sources we do not know when Sheshonq's campaign took place. Construction work on the pylon and the court, on whose exterior walls the scene of triumph is depicted, began in his year 21 (possibly his last year but one), as recorded on a rock-stela.[81] The majority opinion is that the construction work and the campaign were connected to each other and that the campaign did not take place very long before construction work started, in year 20 at the earliest. An essential point for the temporal connection between the campaign and the construction work could be that of the whole decoration which was planned in Karnak only this triumphal scene has been completed. So if this campaign really took place in year 20 or 21, Shoshenq's reign would have begun in 946 or 945 BC. However, we can in no way be certain that the campaign took place immediately before the construction work started.[82] There is no reason why it could not have

[78] When dating according to the High Priests' years of office, we nevertheless have to consider the necessity of adding a few (possibly 2–3) years to Herihor's term of office under Ramesses XI *subsequent to* Payankh's term of office. Anyway, Ramesses XI's absolute length of reign (or the length of the *wḥm-mswt*-era) is uncertain.

[79] *Kings* I 14,25; II *Chronicles* 12,2.

[80] Cf. Hornung, *Untersuchungen*, 24–29; Kitchen, *TIP* § 59; Beckerath, *Chronologie* 68–70. This fixed point is only valid if we work on the assumption that the information concerning the kings' lengths of reign in the OT has been taken from reliable sources.

[81] R. A. Caminos, *JEA* 38 (1952), 46–61.

[82] Almost unanimous in the literature: presumably supported by the wish for at least one fixed point.

taken place several years earlier.[83] In that case, the beginning of Shoshenq's reign would have to be set slightly later, and thus the entire Dyn. 21.

[83] Even if we could establish that there was a causal relationship between the campaign and the construction work, the work in Thebes could still have been begun long after the campaign. One could argue that the first priority was the enlargement and decoration of the LE temples and that simultaneous work in LE and UE was beyond the capacity of both the labour force and the architects. At least the temple of El-Hibeh in Middle Egypt had a depiction of the triumph, cf. *ASAE* 2 (1901), 85–87; 154–156; H. Ranke, *Koptische Friedhöfe bei Karâra und der Amontempel Scheschonks I. bei el Hibe* (Berlin & Leipzig, 1926), 50–52; pls. 19–21; E. Feucht, *SAK* 9 (1981), 105–117; pl. 2.

II. 10 THE CHRONOLOGY OF THE THIRD INTERMEDIATE PERIOD: DYNS. 22–24

Karl Jansen-Winkeln

The prevailing conditions and patterns of rule during Dyns. 22–23 were basically similar to the state of Egypt during Dyn. 21. UE—with the important centers Thebes and Herakleopolis—was administered by a military governor who was simultaneously the High Priest of Amun; LE was directly governed by the king with residences in Memphis and Tanis (and in Bubastis as well, since Osorkon I). With the aid of their sons, the first kings of Dyn. 22 maintained their rule over the entire country. However, since the reign of Osorkon II at the latest, they gradually lost out to the powers of decentralisation, when (due to a divided inheritance?) clearly defined and separate spheres of power and local potentates appeared, particularly in LE.[1] In the same fashion, the separation of UE and LE remains tangible under Libyan rule.[2]

The most important chronological sources for UE are the records of the Nile levels,[3] the annals of the priests at Karnak,[4] the "Chronicle of Prince Osorkon",[5] and the statues (and other objects) belonging to dignitaries from certain families which permit detailed and extensive genealogies;[6] for LE, we only have the donation stelae[7] and the stelae from the Serapeum.[8] Altogether, there are relatively few actual dates

[1] It is not clear whether this regionalisation only came into existence at this time, or whether it existed earlier, i.e., already perhaps in Dyn. 21, but only became clear in the sources at this time (the most important sources are the donation stelae, and these only become abundant from later Dyn. 22, being totally absent in Dyn. 21). It is probable that there were at least incipient developments in this direction, which became more strongly expressed later.

[2] In fact, this division led to different cursive scripts used in the administration: the "anormal" hieratic in UE, and "Demotic" in LE.

[3] *PM* II^2, 21–22; J.v. Beckerath, *JARCE* 5 (1966), 43–55; G. Broekman, *JEA* 88 (2002), 163–178.

[4] *PM* II^2, 108; G. Legrain, *RT* 22 (1900), 51–63; Kruchten, *Annales*.

[5] *PM* II^2, 35–36; Reliefs III, pl. 16–22; Caminos, *Chronicle*.

[6] Cf. *TIP*, §§ 157–205; Bierbrier, *LNK*, passim.

[7] See Meeks, *Donations*.

[8] See CSSM; PM III^2, 780ff.

surviving from this period. As a rule—in contrast to the NK[9]—we lack a continuous series (or even relatively complete chain) of dates for any given sovereign, and thus by no means can we confidently suggest that the highest known date for any reign reflects its actual length. Given this paucity of dates, the chronology of this era is imprecise and uncertain in many respects.

The actual means of dating was presumably the same as that of the NK, [10] as is suggested by the dates from one Serapeum stela.[11] These affirm that an apis bull, born in year 28 of Shoshenq III, was introduced on 1/II/*Akhet* of the same year: if the year began on 1/I/*Akhet*, the Apis would have been a month old at the most—and this is highly unlikely.[12] Furthermore, his predecessor was buried in the same year,[13] and there are generally several months between the burial of the previous Apis and the introduction of the new one.[14] It follows that the regnal year still began with the accession of the king; unfortunately, there are no surviving accession dates for the TIP.

1. *The Rulers of Unified Egypt of Early Dyn. 22*

According to Manetho, following Africanus, Dyn. 22 consisted of 9 kings from Bubastis who ruled for 120 years: Sesonchis (21 years), Osorthon (15), three others (25), Takelotis (13) and three more (42).[15] The family tree in the Serapeum stela of Pasenhor from year 37 of Shoshenq V (*ʿ3-ḫpr-Rʿ*)[16] includes a reference to a King Osorkon who ruled six generations earlier, whose father, grandfather and great-grandfather were kings named Takelot, Osorkon und Shoshenq, while their forefathers were not kings, but rather Libyan princes. The non-royal origins of the earliest named king, Shoshenq, the exact correspondence of the names of the kings with those listed by Manetho for

[9] Cf. *KRI*, VIII, 70–84.

[10] Thus also Beckerath, *Chronologie*, 10. It is *a priori* probable that the MK concept of "predating" was among the anachronisms introduced during Dyns. 25–26.

[11] Louvre SIM 3697, cf. CSSM, 21–22; pl. VIII (no. 22). R. Krauss drew my attention to the importance of these dates.

[12] Cf. E. Winter, *Der Apiskult im Alten Ägypten* (Mainz, 1983), 18.

[13] Stela Louvre SIM 3749, CSSM 19–20; pl. VII (no. 21).

[14] See L. Depuydt, *JNES* 54 (1995), 123; Kienitz, *Geschichte*, 155.

[15] According to Eusebius only 3 kings in 49 years, namely Sesonchosis (21), Osorthon (15) und Takelothis (13).

[16] Louvre SIM 2846, cf. CSSM 30–31; pl. X (no. 31).

this dynasty, and the period of time separating Pasenhor (nine generations to year 37 of Shoshenq V) clearly reveal that these were the first kings of Dyn. 22. In addition, the grandparents of this oldest Shoshenq link him to Dyn. 21, as he is the nephew of the third to the last king of that dynasty, Osorkon (Osochor).[17] This gives a sequence of 4 kings, each pair being father and son, for the start of Dyn. 22: Shoshenq I (*Ḥḏ-ḫpr-Rꜥ*), Osorkon I (*Sḫm-ḫpr-Rꜥ*), Takelot I (*Ḥḏ-ḫpr-Rꜥ*) and Osorkon II (*zꜣ Bꜣstt Wsr-mꜣꜥt-Rꜥ*).[18]

Although each king is the son of a former king, this does not necessarily mean that each son immediately followed his father in office. It is entirely possible that other sovereigns can be fitted into the sequence. According to Africanus, Manetho inserts three other kings, and the following are candidates for this:

a) On his own documents, and in the patronymic of his son (a priest of Amun named Osorkon), the HPA, Shoshenq, son of Osorkon I and grandson of Psusennes II is designated as HP and Generalissimo and not as king.[19] Only on the London statue BM 8 does he enclose his name (in the titulary of HP) in a cartouche, adding the epithet *mrjj-Imn*.[20]

b) The statue Cairo CG 41292 from Karnak[21] was re-inscribed by a king Shoshenq with the throne-name *Mꜣꜥ-ḫpr-Rꜥ Stp-n-Rꜥ*, and to the benefit of his "begetter" (*msj sw*) Psusennes II. It is entirely possible that this is an otherwise completely unknown son of Psusennes II,[22] but it seems more reasonable to assume that this is the (earlier?) high priest and son of Osorkon I,[23] who could easily have designated himself as "begotten" by Psusennes, his grandfather.[24]

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[17] J. Yoyotte, *BSFE* 77–78 (1977), 39–54; cf. above Jansen-Winkeln, Chapter II. 9.

[18] The throne-names were not listed on the stela of Pasenhor. Assigning the kings with these throne-names to the first kings of the dynasty results from a (i.a.) comparison with the kings appearing in the family tree of the Theban Nakhtefmut family, cf. *TIP*, § 88. For the throne-name of Takelot I, cf. *VA* 3 (1987), 253–258; *TIP*³, XXII–XXIII.

[19] The catalogue of these monuments (all from UE): K. Jansen-Winkeln, "Historische Probleme der 3. Zwischenzeit", *JEA* 81 (1995), 145–146.

[20] S. PM II², 289.

[21] G. Legrain, *Statues et statuettes de rois et de particuliers*, III (Cairo, 1914), 1–2; pl. 1; J.v. Beckerath, *Orientalia* 63 (1994), 84–87; K. Jansen-Winkeln (n. 19), 147–148; pl. XIII.

[22] G. Broekman, *GM* 176 (2000), 39–46, considers Shoshenq *Mꜣꜥ-ḫpr-Rꜥ* to be a son of Psusennes II who was able to assert his claims to be the royal successor of his father in Thebes at least, while Shoshenq I was recognized in LE (and dates in Thebes followed his reign).

[23] Thus also Beckerath (n. 21), 86; N. Dautzenberg, *GM* 144 (1995), 21.

[24] As *jtj* and *zꜣ* can mean "grandfather" and "grandson".

c) A number of kings were subsequently interred in the antechamber of the tomb of Psusennes I at Tanis, including two anonymous mummies[25] and a Shoshenq *Ḥq3-ḫpr-Rʿ Stp-n-Rʿ*,[26] who was presumably already more than 50 years of age[27] and whose throne-name bore a form reminiscent of early Dyn. 22 (before Osorkon II),[28] and the same applies to the iconographic details of his shabtis.[29] The interment also included a pectoral of the great chief of the Ma, Shoshenq A, and a bracelet of Shoshenq I[30]—and thus the same person before and after the accession. As the individuals interred in the royal tombs often bore objects belonging to their parents,[31] this king is probably a son of Shoshenq I.[32] The commonly assumed identification of this king with the (earlier) HP and son of Osorkon I[33] does not appear to be very probable.

d) A king Shoshenq with the throne-name *Twt-ḫpr-Rʿ* is known from the sherd Louvre E.31886 from Abydos,[34] and apparently also from a fragmentary relief from Tell Basta.[35] This is evidently a king of the entire country and not a minor UE king or a local ruler. The form of the throne-name implies that he too belongs near the start of Dyn. 22.

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[25] Possibly Siamun and Psusennes II, cf. J. Yoyotte in *Tanis: L'or des pharaons* (Paris, 1987), 48.

[26] Montet, *Tanis II*, 36–51

[27] D. E. Derry, *ASAE* 39 (1939), 549–551.

[28] *TIP*, § 93.

[29] G. Broekman, *GM* 181 (2001), 29–31.

[30] Montet (n. 26), 43–45 (219; 226/227); fig.13.

[31] *TIP*, § 93; K. Jansen-Winkeln, *VA* 3 (1987), 256–257; D. Aston, "Takeloth II—A King of the 'Theban Twenty-Third Dynasty'?", *JEA* 75 (1989), 139–153, esp. 143–144.

[32] In addition he also bore the ring of a *Ḏd-Ptḥ-jw.f-ʿnḫ* (Montet [n. 26], 44, fig. 13; 46 [228]), perhaps his brother: a prince und 2nd/3rd Prophet of Amun of this name was interred in the cachette of Deir el-Bahri in year 11 of Shoshenq I (G. Maspero, *Les momies royales de Déir el-Baharî* (Paris 1889), 572–574; *GLR*, III, 284, n.2). He was presumably a son of Shoshenq I.

[33] *TIP*, §§ 93–94; 452; most recently with new arguments Broekman (n. 29), 27–37. Rather than identifying Shoshenq *Ḥq3-ḫpr-Rʿ* with the son of Osorkon I and grandson of Psusennes II, and thus being obliged to reckon with yet another new and hitherto unknown son of Psusennes, it appears more reasonable to identify the grandson of Psusennes II with the donor of *CG* 42192 and to identify Schoschenk *Ḥq3-ḫpr-Rʿ* as a son of Shoshenq I, based upon his grave goods.

[34] According to the reading of J. Yoyotte, cf. M.-A. Bonhême, *BSFE* 134 (1995), 53.

[35] E. Lange, *GM* 203 (2004), 65–72. The arrangement of the cartouches does not allow one to deduce a coregency of *Twt-ḫpr-Rʿ* (= Psusennes II) and Shoshenq (I) as Dodson does (*BES* 14 [2000], 9–10). Aside from this, Osorkon I is thus far considered to be the first sovereign of the TIP documented in Bubastis.

The HP Shoshenq ("II") is presumably identical with Shoshenq *Mꜣꜥ-ḫpr-Rꜥ*, but most certainly did not have an independent reign, but rather was responsible for UE during the reign of his father. Shoshenq *Ḥqꜣ-ḫpr-Rꜥ* may have ruled briefly after his father, if Shoshenq I was his father, or perhaps after his brother Osorkon I. He could thus have been one of the "three other kings" Manetho places between Osorkon (I) and Takelot (I).[36] The same applies to Shoshenq *Twt-ḫpr-Rꜥ* who should most probably be put between Osorkon I and Takelot I. In contrast to his father and his son, not one single royal monument is known for Takelot I;[37] his brothers in UE probably dated according to his reign (cf. below), but they do not name him. This could indicate that his rule was undisputed.

For the first part of Dyn. 22 we would thus have the following kings, and dates:

1. Shoshenq I; documented years 2, 5, 6, 10, 11, 13, 21[38]
2. Osorkon I: regnal years [1]-4, 6, 10, 11, 12, 23, 33[39]
3. Shoshenq *Ḥqꜣ-ḫpr-Rꜥ*: no dates
4. Shoshenq *Twt-ḫpr-Rꜥ*: no dates
5. Takelot I: years: 9,[40] dubious 5, 8, 13/14, 14 (cf. below)
6. Osorkon II: years 12, 16, 21, 22, 23,[41] 29(?)[42]

For Shoshenq I, Manetho's 21 years appear to be possible, and a reign of 35 years is quite probable for Osorkon I.[43] Only a year 9 is certain for Takelot I. The Nile level records nos. 16–21 are generally assigned to his reign: nos. 16 (year 5) and 20–21 (years lost) belong to the HP

[36] Takelot II cannot be implied, as he was an UE sovereign, cf. below.

[37] Cf. also *TIP*, §§ 95; 270.

[38] The highest regnal year on the rock stela of Gebel Silsila, cf. *JEA* 38 (1952), pl. XIII.

[39] Of these, only the year 10 in lines 2–3 of the "stèle de l'apanage" (*ZÄS* 35 [1897], 14) and year 12 of the Nile level record no. 2 (Beckerath [n. 3], 49) are *explicitly* related to Osorkon. Regnal year 33 is on the mummy wrappings of a burial, which also had a "counterweight" bearing the name and throne-name of Osorkon I, cf. J. E. Quibell, *The Ramesseum* (London 1998), 10–11; pl. XVIII.

[40] G. Daressy, *RT* 18 (1896), 52–53, earlier ascribed to Takelot II, cf. now Aston (n. 31), 144; *TIP*[3], XXIII.

[41] Serapeum stela Louvre SIM 3090, s. CSSM, 17; pl. VI (no. 18).

[42] Nile level record no. 14, cf. below.

[43] Were one to follow Manetho here, we would still be obliged to emend 15 years to 35. Aside from the 33 which should in all probability to assigned to Osorkon I (cf. above), there are further indications of a long reign, cf. *TIP* § 89.

Iuwelot who was still a youth in year 10 of the reign of his father, Osorkon I.[44] The year 5 must therefore relate to a successor of Osorkon I.[45] The records nos. 17–19 are from the HP Smendes III, doubtless the brother and successor of Iuwelot;[46] no. 17 is from year 8, no. 18 from year 13 or 14. A block, presumably from the Serapeum, bears the names of Takelot I and the HP of Memphis, Merenptah;[47] Mariette noted that this was found together with a stela from a year 14.[48] This might be a stela in Alexandria dated to a year 14 (without a royal name), and originally came from the Serapeum, as the inscription suggests.[49] This would thus support Manetho's 13 (full) years for Takelot. His possible predecessors (see above) have not left many traces and assuredly did not reign for a long period.[50] Thus for Takelot and the others, 15 years is a reasonable suggestion.[51] One can therefore adopt Kitchen's suggestion of 21 + 35 + 15 years for the first 3 to 5 kings of Dyn. 22. However, these dates should be viewed as the minimum to which a few more years might be added.

The length of the reign of Osorkon II is a matter of debate, and Manetho cannot aid here. The highest date which can with certainty be assigned to his reign is year 23 (see above), linked to an Apis burial, where his son, the Crown Prince and HP of Memphis, Shoshenq D apparently also took part.[52] Shoshenq D will thus have died after that time, but apparently before his father,[53] and thus Kitchen assigned Osorkon II 24–25 full years, to allow a margin for these events.[54]

[44] Lines 2–3 of the "stèle de l'apanage", cf. *ZÄS* 35 (1897), 14.

[45] But certainly not to Osorkon II, whose Nile level records take a different form, cf. Broekman (n. 3), 171.

[46] These records have exactly the same form as those of Iuwelot and differ from all others, cf. most recently Broekman (n. 3), 164; 170–171.

[47] CSSM, 18; pl. VII (no. 19).

[48] Mariette's remarks are, however, rather doubtful, cf. n. 47.

[49] G. Daressy, *ASAE* 5 (1904), 121 [XXIV]. The stela Louvre SIM 2810 (CSSM, 18–19; pl. VII [no. 20]) of a *Ḏd-Ptḥ-jw.f-ʿnḫ* of a year 10 [+ X] (without royal name) dates to a later epoque, cf. A. Leahy, *SAK* 7 (1979), 149.

[50] If there was a conflict over the throne, it is conceivable, that some of them ruled parallel to Takelot.

[51] If there really was an Apis burial in year 14 of Takelot, and the Apis buried in year 23 of Osorkon II was the successor of this bull (which is, of course, uncertain) it would favour placing year 14 towards the end of the reign of Takelot, as 26 years are the longest documented life of an Apis bull.

[52] Can no longer be verified, cf. *TIP*, § 81, with n. 77; *GM* 207 (2005), 76, n. 16.

[53] This was generally assumed because he is also designated as Crown Prince (*rpʿt wr tpj n ḥm.f*) in his tomb.

[54] *TIP*, § 87.

This logic is no longer tenable since Shoshenq D did in fact outlive his father. In his undisturbed burial was a chain of 8 *Wḏ3t*-amulettes (Cairo JE 86786), and one of them bore the name of Shoshenq III (*Wsr-m3ʿt-Rʿ Stp-n-Jmn Mrjj-Jmn z3 B3stt Ššnq*).[55]

On the other hand, Aston has produced arguments that Osorkon II's reign was clearly longer than previously assumed, and perhaps even 40–45 years.[56] Aston's argument is based on the family trees of two Theban families which reveal that several generations lived in the reign of Osorkon II; other genealogical data likewise allegedly favours a longer reign; furthermore, there would be a whole series of HPA belonging to the reign of Osorkon II, and his three known sons would all have predeceased him. Of these arguments, only the family tree of the Nakhtefmut family[57] is really reliable, but this actually supports a relatively long reign for Osorkon II. Whether the genealogy of the Nebneteru-family[58] must also be understood in this sense is more debatable: the statue Cairo CG 42225 was erected after the death of its owner, so that the name of the king and the high priest there could relate to the date of erection and not necessarily hint at the lifetime or term of office of the statue's owner. The other genealogical data which Aston introduces does favour a long life, but not necessarily a long reign for Osorkon II. As HPA under Osorkon II only his son Nimlot C, his grandson Takelot F[59] and Harsiese B are documented.[60] Of the sons of Osorkon II, Harnakht C died as a child, Shoshenq D probably did outlive his father (see above), and thus effectively only Nimlot C predeceased him.[61] Nevertheless, I consider the basic sense of Aston's arguments to be correct. There is a Nile level record (no. 14)

[55] K. Jansen-Winkeln, "Der Prinz und Hohepriester Schoschenk (D)", *GM* 207 (2005), 77–78. It is conceivable (although rather improbable) that Osorkon II died immediately after his son, and thus his successor may have been able to arrange for a gift for the burial. In this case, it would be certain that Shoshenq III was the immediate successor of Osorkon II (cf. below).

[56] Aston (n. 31), 145–148.

[57] Ibidem, 145.

[58] Ibidem, 146.

[59] Presumably the later Takelot II, cf. K. Jansen-Winkeln (n. 19), 138–139; Dautzenberg (n. 23), 24.

[60] Jansen-Winkeln (n. 19), 135–139.

[61] It is interesting to note incidentally that this HPA did leave hardly any traces in Thebes, being almost exclusively recorded in the genealogical records of his descendents there, and even there he is consistently designated as HPA and General of Herakleopolis.

from the year 29 of an *Wsr-mꜣꜥt-Rꜥ*, who is most probably Osorkon II and not Shoshenq III or Osorkon III.[62] At the very least, the family tree of the Nakhtefmut-family clearly supports a reign for Osorkon II of more than the 24 or 25 years Kitchen allows him. In addition, it must be recalled that it is precisely from the reign of Osorkon II that we have comparatively numerous monuments, both royal and private: far more than from the eras of Shoshenq I, Osorkon I and Shoshenq III who are otherwise the best documented of the TIP. It is therefore not too bold to suggest a reign of at least 30–40 years for Osorkon II. In this era, it is hardly surprising that we do not have any dates from the final decade of the reign.

The king Harsiese (A) also belongs to the period of Osorkon II: on the stelaphoric statue Cairo CG 42208 we see the complete titulary of Osorkon II, but the statue was dedicated "by the grace" of Harsiese.[63] This Harsiese is known only from UE,[64] and was buried in Thebes. There are no known regnal years relating to him, and dating in his era presumably followed Osorkon II.[65] His reign should probably be assigned to the beginning of the reign of Osorkon II;[66] in any case, it is not chronologically relevant.

The period from Shoshenq I to Osorkon II should have lasted about 100–111 years (21 + 35 + 15 + 30–40), and would be ca. 945/40–844/29.

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[62] Cf. Broekman (n. 3), 174–5.

[63] K. Jansen-Winkeln, *Ägyptische Biographien der 22. und 23. Dynastie* (Wiesbaden: ÄUAT 8, 1985), 453.

[64] Jansen-Winkeln (n. 19), 133–5. He is only documented as king, contrary to the common view, he is not documented as HPA even one single time. Earlier, he was viewed as the son of the HPA Shoshenq (II); but since it became evident that this was based on a mistaken reading (ibidem, 129–132), he has become an orphan. In the necropolis of the TIP at Herakleopolis was the burial of a woman named *Tꜣ-nt-Jmn*, in Tomb 4. According to the inscriptions of the tomb and grave goods (M. Perez-Die/P. Vernus, *Excavaciones en Ehnasya el Medina* (Madrid 1992), 50–59; 128–132; 156–159; Docs. 21–26), she was *wrt ḫnrt n Ḥrj-š.f*, her father was the *ḥm-nṯr tpj (n) Jmn mr mšꜥ ḥꜣwtj Ns-bꜣ-nb-Ḏdt*, and her mother was *Ꜣst-Ꜣḫbjt* or *Jḫy* (shortened version) and she is designated as *mwt nṯr*. Represented together with *Tꜣ-nt-Jmn* was a man named Osorkon, who was *wr ꜥꜣ n <pr>-Sḫm-ḫpr-Rꜥ*. It necessarily follows that the HP Smendes, the father of *Tꜣ-nt-Jmn*, cannot have been Smendes II of Dyn. 21. If this is not an HP Smendes unknown from other sources, the only candidate is Smendes III of Dyn. 22. As his wife is designated a "king's mother" (*mwt nṯr* cannot be a sacerdotal title here), Smendes III must have had a son who became king, and who belongs to the generation of Osorkon II. Harsiese is the obvious candidate.

[65] However, the lack of dates could simply be the result of the type of documents which are preserved.

[66] Jansen-Winkeln (n. 19), 135.

2. *Takelot II*

Related to the length of the reign of Osorkon II and equally controversial is the question of the identity of his successor; the stela of Pasenhor has nothing to say on the matter. The HP Osorkon (B) who left a long inscription ("The Chronicle of Prince Osorkon") was a son of Takelot II (throne-name *Ḥḏ-ḫpr-Rꜥ* as with Takelot I), his mother was a daughter of the HP Nimlot (C) and a granddaughter of Osorkon II. In the inscription, the donations are at first dated according to the reign of Takelot II (until year 24), and then according to the reign of Shoshenq III (years 22–29), and thus a sequence of Osorkon II—Takelot II—Shoshenq III was deduced.[67]

D. Aston has dismissed this long established chronology for several reasons:[68] (1) Takelot II is only known in UE; (2) he has the epithet *nṯr ḥqꜣ Wꜣst* in his throne-name; (3) his consort and children do not reveal any known links to LE either; (4) the genealogical details of his dependents hint that he belonged to the generation of the grandchildren of Osorkon II; (5) in the "Chronicle of Prince Osorkon", the years 22–29 of Shoshenq III follow years 11–24 of Takelot II: were Takelot the predecessor of Shoshenq III, we would face a lacuna of more than two decades. Aston thus assumes that Takelot was a "Theban" ruler whose realm was restricted to UE, and thus that he ruled parallel to a LE sovereign. This would have major chronological consequences.

K. A. Kitchen has strongly rejected this approach by attempting to disprove or disarm Aston's arguments:[69] Takelot II left relatively few traces in Thebes; other kings who definitely lived in a Delta residence had relations with Thebes; the epithet *nṯr ḥqꜣ Wꜣst* was also borne by Shoshenq V (in Tanis); other kings of the TIP, such as Osochor, Psusennes II or Osorkon IV were rarely or not attested in LE, although they actually resided there. On the other hand, he suggests that the scenario leading to this "Theban" Takelot II is historically excluded: the Thebans would hardly have accepted a king in Thebes but rejected

[67] *TIP*, § 86; as noted already in principle by R. Lepsius (*Über die XXII. ägyptische Königsdynastie*, Berlin 1856, 271–274), who inserted yet another Shoshenq ("II", our Shoshenq D) between Osorkon II and Takelot II.

[68] Aston (n. 31), 140–144.

[69] *TIP*[3], XXIII–XXIV; *JEA* 85 (1999), 247; *BiOr* 58 (2001), 383.

and opposed his son as HP, and they would never have tolerated this HP as the later king Osorkon III. This argumentation is not convincing. Takelot II and his son definitely belonged to a common "party" in the civil war; had Osorkon B been expelled from Thebes, the same would be true of his father. And it is rather doubtful that the opinion of the people (the "Thebans") would have had any role to play. Kitchen's replique does not dispose of the really decisive point: Takelot II and his entire family are attested only in UE and not at all in the Delta, and this point cannot be dismissed by references to such ephemeral rulers as Osochor, Psusennes II or Osorkon IV. The period from Osorkon II to Shoshenq III is the best documented of the TIP and both kings are demonstrably present in LE. That anyone else reigned in the same place for a quarter of a century, of whom (and whose dependents) no trace can be found, must be excluded. The genealogical connections of Takelot II and the sequence of years in the "Chronicle of Prince Osorkon" are likewise very clear. In addition, the HP Osorkon B disappears at the very moment (year 39 of Shoshenq III) when an otherwise unknown Osorkon appears as a new king; this is the only sovereign of Dyn. 22 who occasionally uses the title of HP in his royal name,[70] and his mother has the same name as the mother of the HP. It therefore follows that Osorkon B and Osorkon III are the same person, and that also demands that Takelot II must be placed parallel with Shoshenq III. There is thus a whole set of reasons supporting Aston's assumption, and nothing which contradicts it. Therefore, I consider the point to be certain.

3. *The LE Sovereigns of Dyn. 22 to Shoshenq V*

This would thus mean that Shoshenq III was the immediate successor of Osorkon II, and there is not the slightest hint of any other hitherto unknown king between them.[71] With Shoshenq III and his successors until Shoshenq V, we stand on firmer ground chronologically. For

[70] The Paleological Association of Japan, Akoris. Report of the Excavations at Akoris in Middle Egypt 1981–92 (Kyoto, 1995), 301–305; pl. 116; idem, Preliminary Report. Second Season of the Excavations at the Site of Akoris, Egypt 1982 (Kyoto, 1983), 14–15; pl. 11. No other HPA is known from the period before Osorkon III with this name, aside from Osorkon B.

[71] Cf. also Aston (n. 31), 144.

Shoshenq III, recorded years include: 3, 5(?), 6, 12, 14, 15, 18(?), 22, 23, 24, 26, 28, 29, 30, 31, 32, 33, 38, and 39.[72] An Apis-bull was buried in his year 28, and a stela commemorating the event[73] was erected for the great chief of the Ma and HP of Memphis[74] *Pꜣ-dj-ꜣst*, who was the grandson (through his mother *Ṯz-Bꜣstt-prt*) and at he same time the great-grandson (through his father Vater *Ṯkrjt*) of Osorkon II. The successor of this Apis bull (introduced in the same year year, 1/II/*Akhet*) in turn died in year 2 (II/*Peret*) of Pami, after reaching the age of 26 years.[75] Year 2 of Pami thus lies 26 years after year 28 of Shoshenq III. Were Pami the successor of Shoshenq III, the latter would have had a reign of no less than 52 years. In fact, however, it would appear highly probable that another king Shoshenq with the throne name *Ḥḏ-ḫpr-Rꜥ* should be inserted here,[76] who was buried in the tomb of his predecessor. The most important piece of evidence here is a donation stela of year 10 from a King Shoshenq *Ḥḏ-ḫpr-Rꜥ*,[77] mentioning a Great Prince of the Libu named Niumateped, and a man apparently bearing the same name and title is documented from year 8 of Shoshenq V.[78] If, as would appear reasonable, this is the same person, then a king Shoshenq *Ḥḏ-ḫpr-Rꜥ* should be placed here, who reigned not long before Shoshenq V, but after Shoshenq III. As Shoshenq V probably reigned immediately after or following a very short interval after his father Pami, yet 13 years lay between year 39 of Shoshenq III and year 2 of Pami, for which we have no dates for Shoshenq III, then everything favours placing a 10–13 year reign of this Shoshenq *Ḥḏ-ḫpr-Rꜥ* into this period.[79] The precise length of his reign is chronologically not very important since the total for the period between year

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[72] Nile level record no. 22, cf. Beckerath (n. 3), 51; Annals of the priests, no.7, cf. Kruchten, *Annales*, pl. 4; 19.

[73] Louvre SIM 3749, cf. CSSM, 19–20; pl. VII (no. 21).

[74] His son *Pꜣj.f-ṯꜣw-(m-)ꜥwj-Bꜣstt* likewise bears the title of HP of Memphis on this stela.

[75] Louvre SIM 3697, CSSM 21–22; pl. VIII (no. 22); cf. also the Stelae Louvre SIM 3736 and 4205, ibidem, 22–24; pl. VIII–IX (nos. 23/24).

[76] A. Dodson, GM 137 (1993), 53–58; *TIP*^{3}, XXV–XXVI.

[77] Meeks, *Donations*, 666 (22.1.10).

[78] While in year 31 of Shoshenq III, yet another great chief by the name *Jnj-Jmn-nꜣj.f-nbw* is documented, cf. J. Yoyotte, in: Mélanges Maspero I, Orient ancien 4 (Cairo 1961), 143 (§ 31).

[79] Numbered variously in the literature: Ib, IIIa, IV or "*quartus*"; IIIa would be preferable, as this would eliminate all possible sources of misunderstanding.

28 of Shoshenq III and year 2 of Pami is certain. For this king Pami,[80] the years 2, 4, 5, and 6 are documented; from the structure of the text on his "annals" in Heliopolis, the presence of the years 3 and 7 can be deduced.[81] Were these "annals" to have covered the entire reign of Pami,[82] this would confirm Kitchen's assessment of 6 full years for the reign.[83] This assumption of a rather short reign for Pami is supported by the paucity of monuments he has left, and further by the fact that the reign of his son was quite long. However, the assumption of a mere 6–7 years is not really certain. His son Shoshenq V followed Pami, probably as his immediate successor: a stela from the Serapeum from year 37 of Shoshenq V bears the name of the same (still living) donor as in year 2 of Pami.[84] It is thus improbable that this long period can be stretched any further. But, it cannot be excluded that another king (e.g., an older son of Pami) may have ruled between Pami and Shoshenq V, but then if at all, only very briefly.[85]

For Shoshenq V, the years 7, 8, 11, 15, 17, 19, 22, 36, 37, and 38 are documented,[86] and the interval between year 28 of Shoshenq III and year 2 of Pami is 26 years long. If 6 full years are assigned to Pami, and Shoshenq V was his immediate successor, the period from Shoshenq III to year 38 of Shoshenq V would be 27/28 + 26 + 4/5 + 37 years, and thus 94–96 years depending upon exactly when that Apis which died under Pami was introduced under Shoshenq III and when it died under Pami. The interval is probably 95 years.

4. *The Successors of Shoshenq V*

Shoshenq V is not among the rulers named on Piye's victory stela. He was probably already dead at the time. Appearing on a dedicatory stela

[80] See J. Yoyotte, *RdE* 39 (1988), 160–169.
[81] S. Bickel, L. Gabolde & P. Tallet, *BIFAO* 98 (1998), 31–56, esp. 41.
[82] Cf. ibidem, 42.
[83] *TIP*, § 83.
[84] Louvre SIM 3441 and 3091, cf. CSSM, 24–25; pl. IX (no. 25); 41; pl. XIII (no. 42), cf. *TIP*, § 84, n. 97.
[85] However, the documented lifetime of the Apis-bulls do allow a somewhat longer period between Pami and Shoshenq V. A bull was buried in year 11 of Shoshenq V: between this one and the last known predecessor, buried in year 2 of Pami, are only 15–16 years if Shoshenq V immediately followed Pami.
[86] PM III^2, 787–789.

of his year 36[87] is Tefnakhte, the Great Chief of the Ma, commander and prince of the Libu, and again on another of year 38, that same Tefnakhte is called "Great Prince of the entire land".[88] The extension of this prince's power, which later obliged Piye to intervene, was thus already apparent at this time. It thus follows that the interval between the last years of Shoshenq V and Piye's campaign was not long. Shoshenq V is documented in Memphis and in diverse areas of the Delta, including Tanis, Bubastis, Buto and Kom Firin. On Piye's stela, Tefnakhte is lord of Memphis, Buto and Kom Firin; Iuput II rules in Leontopolis,[89] Osorkon IV in Bubastis and the region of Tanis.[90] Osorkon IV would thus be spatially and temporally the successor of Shoshenq V, and the contemporary documents do not provide any reason to assign him to another dynasty.[91]

On the issue of the identity of Shoshenq's immediate successors, the temporal and spatial position of Manetho's Dyn. 23 could play a role. If Petubaste I and Osorkon III were UE rulers (cf. below, section 5), then Manetho certainly did not take them into consideration. Thus they could not be those kings whom he assigned to his Dyn. 23 of Tanis (consisting of Petubaste, Osorkon, "Psammus" and "Zet"). Priese[92] thus suggested that Osorkon IV (rather than III) be assigned to Manetho's Dyn. 23, A. Leahy has further elaborated on this idea.[93] Thus, Osorkon IV would be the successor of the ephemeral Petubaste, *Sḥtp-jb(-n)-Rꜥ*,

[87] From Buto (former collection Farouk), cf. Yoyotte (n. 78), 153, § 48; Meeks, *Donations*, 670 (22.10.36).

[88] From Tell Farain (in the storeroom?), cf. S. Sauneron, *BSFE* 24 (1957), 51; 53–54, figs.1–2. The cartouches were left blank, but it unquestionably concerns the year 38 of Shoshenq V, cf. *TIP*, § 84. The king is omitted on the other stela as well, which only has the year.

[89] A regnal year 21 is documented (J.-L. Chappaz, *Genava* 30 [1982], 71–81), but neither precedessors nor successors are known and thus he cannot be linked to any dynasty.

[90] If *Rꜥ-nfr* is to be understood in this way, cf. Yoyotte (n. 78), 129, n. 2; F. Gomàa, *Die libyschen Fürstentümer des Deltas* (Wiesbaden: Beihefte TAVO B, 6, 1974), 132–134. If not, then it means that, astonishingly, Tanis—one of the most prominent cities of the TIP—was not mentioned on the stela of Piye. This could only be explained if the rulers of Tanis declined to submit to the Nubian king.

[91] Leahy's interpretation, that "there is nothing to warrant his inclusion in . . . Manetho's Twenty-second Dynasty" (*Libya*, 189) is thus not entirely convincing. Incidentally, Osorkon IV is only documented with certainty on the stela of Piye: the other references could also be assigned to Osochor of Dyn. 21, cf. Leahy, *Libya*, 189; F. Payraudeau, *GM* 178 (2000), 75–80.

[92] *ZÄS* 98 (1972), 20, n. 23.

[93] *Libya*, 186ff.

who is known from Memphis and Tanis (among other places),[94] and otherwise identified with Putubišti of the annals of Assurbanipal.[95] Aston[96] and Beckerath[97] have both followed him. At the very least, this would be a means of integrating Manetho's Dyn. 23 into the previously known, although identifying Petubaste *Sḥtp-jb-Rʿ* with the Putubišti of the Assyrians is at least equally plausible. In any case, the result would be that Manetho's Dyn. 23 would be nothing but a continuation of Dyn. 22.[98]

As regnal years have not been preserved from the reign of either Osorkon IV, nor of his supposed predecessor, Petubaste *Sḥtp-jb-Rʿ*, and the transition from Shoshenq V (—Petubaste)—Osorkon IV is to be dated to before Piye's campaign, this possible insertion of a Petubaste (Manethonis gratia) is not of chronological significance. Osorkon IV is only dated through the campaign of Piye. Were he the king Shilkanni who paid tribute to Sargon II (cf. below), then he will still have been in office around 715/716.

5. *UE Kings and Dynasties from Takelot II to Dyn. 25*

Along with two Lower Egyptian rulers, the stela of Piye names two Upper Egyptians: Nimlot D of Hermopolis and Peftjauʿawybast of Herakleopolis. At this time, Thebes itself will have already been under Nubian control, but before this time we find Harsiese A and Takelot II (cf. above, section 2) as UE kings who ruled Thebes. Of Kitchen's Dyn. 23 (Petubaste I, Iuput I, Shoshenq IV, Osorkon III, Takelot III, Rudamun und Iuput II, as well as perhaps also Shoshenq VI;[99] Residence:

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[94] Cf. Habachi, *ZÄS* 93 (1966), 69–74; pls. V–VI; P. Montet, *Le lac sacré de Tanis* (Paris, 1966), 63–5; pl. XXX.

[95] Cf. *TIP*, § 357.

[96] Aston (n. 31), 140.

[97] *Chronologie*, 99.

[98] This could have been another branch of the family, with deeper roots in Tanis than Bubastis. In any case, according to our present knowledge, Manetho's king list of Dyn. 23 is more or less useless for the historical (and chronological) reconstruction: the last two of his four kings are virtual phantoms, the first two cannot be identified with certainty, and the note that the first Olympiad took place during the reign of Petubaste is generally dismissed as a later invention, calculated by the Christian chronographers who used Manetho, cf. *TIP*, § 419, n. 134; Redford, *King-lists*, 311–312; Beckerath, *GM* 147 (1995), 9.

[99] Shoshenq VI (*Wȝs-nṯr-Rʿ*, cf. *TIP*, §§ 67; 110; 146; 336; M.-A. Bonhême, *Les noms royaux de l'Egypte de la Troisième Période Intermédiaire* [Cairo: BdE 98, 1987], 140–141) is not considered in the following, since his very existence is debatable, and there is in any case no indication of where he should be placed chronologically.

Leontopolis)[100] Iuput II is only documented in LE, Petubaste I mainly in UE, but a few times in LE; the others are known exclusively from Upper and Middle Egypt. Osorkon III is the father of Takelot III and Rudamun, and the later is the father-in-law of Peftjauʿawybast. All of the members of this family are known exclusively from UE sources.[101] They are doubtless UE rulers in the tradition of Harsiese A and Takelot II, and thus are not Manetho's Dyn. 23. The issue is thus the temporal relationship of those kings known from UE sources to one another and to the kings of Dyn. 22. The sources allow for the following synchronisms:

a) In the "Chronicle of Prince Osorkon", years 22–29 of Shoshenq III follow year 24 of Takelot II.[102] This suggests that Takelot II became king in UE during the reign of Osorkon II (as Harsiese A before him, but with his own count of regnal years) and that in his year 4, Shoshenq III became the successor of Osorkon II (in LE).

b) The year 12 of a king who can only be Shoshenq III corresponds to the year 5 of Petubaste I, with Harsiese (B) as HPA.[103] Petubaste I thus began his reign in year 8 of Shoshenq III (= year 11 of Takelot II) and HP Harsiese (B) is linked to this regency. Harsiese (B) is subsequently documented in the years 18 and 19 of Petubaste (= years 25 and 26 of Shoshenq III),[104] and previously in year 6 of Shoshenq III,[105] and already under Osorkon II.[106] A Takelot (E) was HP at the latest from year 23 of Petubaste,[107] who then assumes Harsiese's post.

It is therefore highly probable that the "rebellion" of year 11 of Takelot II mentioned in the "Chronicle of Prince Osorkon" was the accession to the throne of Petubastis,[108] which was understood as a usurpation, as he thus became a kind of rival king to Takelot II. The

[100] *TIP*, §§ 102; 297; 519; p. 588.

[101] And the same applies, as described above, to Takelot II, the father of Osorkon III.

[102] *Reliefs*, III, pl. 22, Z.7–22.

[103] Nile level record no. 24, cf. Beckerath (n. 3), 51. On the identification of the unnamed king as Shoshenq III, cf. *TIP*, §§ 106–107. On purely technical grounds, following the chronology proposed by Aston, Takelot II could also be considered, but historically, he is out of the question, as an opponent of Petubaste and Harsiese B.

[104] Nile level record nos. 28 and 27, cf. Beckerath (n. 3), 52.

[105] Nile level record no. 23, cf. Beckerath (n. 3), 51.

[106] On the statue, Cairo *CG* 42225, for this, cf. Jansen-Winkeln (n. 19), 135–6.

[107] Nile level record no. 29, cf. Beckerath (n. 3), 52.

[108] Chronicle of Prince Osorkon, A, 22ff., cf. *Reliefs*, III, pl. 16; 18.

HP Osorkon B is documented for years 11 and 12 in Thebes,[109] whereas Petubaste I and Harsiese B are not, but another revolt erupts in year 15 of Takelot,[110] and exactly in this year, Petubaste and Harsiese B reappear in the Theban sources.[111] In year 24 and 25 of Takelot (= 14 and 15 of Petubaste I), Osorkon B donated offerings in Thebes, and at this time Petubaste and Harsiese are not documented here. Evidently, there were two parties in this civil war: Osorkon B and his father Takelot II on the one hand, and Petubaste I and the HP Harsiese B, later Takelot E, on the other. [112] This Takelot is also mentioned in the year 6 of a king Shoshenq *Wsr-mꜣʿt-Rʿ Mrjj-Jmn*,[113] who cannot be Shoshenq III,[114] but must rather be an another (certainly UE) King *Wsr-mꜣʿt-Rʿ* Shoshenq (IV).[115]

c) The highest documented regnal year for Takelot II is year 25,[116] and as in the donation lists of the "Chronicle of Prince Osorkon", year 24 of Takelot II is followed by year 22 of Shoshenq III, it was apparently his last.[117] Despite publicly announced claims,[118] the successor of Takelot II was not his son Osorkon B: the latter is still General and HP in year 39 of Shoshenq III.[119] It was presumably Iuput I who was

[109] The son of Takelot II who commissioned the Chronicle of Prince Osorkon.

[110] Chronicle of Prince Osorkon, B,7, s. *Reliefs*, III, pl. 21.

[111] Nile level record no. 24, cf. Beckerath (n. 3), 51.

[112] The role played by Shoshenq III in these events is not evident.

[113] Nile level record no. 25, cf. Beckerath (n. 3), 52.

[114] Cf. Aston (n. 31), 151: Shoshenq III does not use the epithet *Mrjj-Jmn* in his throne-name, and there is already a Nile level record (no. 23) for his year 6, naming HPA Harsiese.

[115] The latest documented date for him is year 6, cf. Beckerath (n. 3), 52. (Nile level record no. 25); Jacquet-Gordon, Graffiti, 40–41 (no. 100).

[116] Donation stela Cairo JE 36159, cf. *ASAE* 4 (1903), 183.

[117] The years 24 and 26 (without the king's name, cf. Capart, BMRAH, 3. série, 13, 1941, 26), are recorded on the mummy wrapping Brussels E.7047b/c of a *mrjj-nṯr* named *Ns-pꜣ-nṯr-n-Rʿ* var. *Ns-nṯr-pꜣ-Rʿ*. As the father of this man is *Ns-r-Jmn* (Cartonage Berlin 30, cf. ÄIB II, 381–382), Kitchen (*TIP* § 86, n.115; 294) and Bierbrier (*LNK*, 71) have both identified him as *Ns-pꜣ-Rʿ*, son of *Ns-r-Jmn* (I), the donor of the statue Cairo *CG* 42221, whose family tree (*TIP*, § 166) suggests that he belongs roughly in the period of Takelot II, and they have thus deduced a year 26 of Takelot II. Since, however, both the name (*Ns-pꜣ-nṯr-n-pꜣ-Rʿ* vs. *Ns-pꜣ-Rʿ*, cf. M. Thirion, *RdE* 46 [1995], 181–182) and the title (*mrjj-nṯr* vs. *ḥm-nṯr n Jmn-Rʿ njswt nṯrw jmj-ꜣbd.f n pr Jmn ḥr zꜣ tpj*) of these individuals differ, this identification (and thus a possible source for a year 26 of Takelot II) cannot be maintained.

[118] Chronicle of Prince Osorkon, A, 53, cf. *Reliefs*, III, pl. 16; 17; *CPO*, §§ 101–102.

[119] Nile level record Karnak no. 22, cf. Beckerath (n. 3), 51; Annals of the Priests at Karnak, no. 7, cf. Legrain (n. 4), 55–56; Kruchten, *Annales*, pl. 4; 19.

the successor, for year 16 of Petubaste I corresponds to year 2 of a king Iuput (I),[120] and thus his year 1 (corresponding to year 15 of Petubaste and year 22 of Shoshenq III) follows immediately on the last full year of Takelot II. As these dates match, it is more probable that Iuput I was the successor of Takelot, and not a "short-lived coregent" of Petubaste.[121] On the other hand, Shoshenq IV may have been the successor of Petubaste as Petubaste appears initially together more frequently with the HP Harsiese B, and then with Takelot E, who himself is then named likewise together with Shoshenq IV (cf. above). These synchronisms produce the relations presented in Fig. II. 10.1.[122]

King Petubaste is documented in Thebes with the throne-name *Wsr-mꜣʿt-Rʿ Stp-n-Jmn* and with the unique epithet *zꜣ ꜣst*.[123] A king with the same prenomen and throne-name, but with the epithet *zꜣ Bꜣstt* is known from a donation stela from Memphis (year 6),[124] from Herakleopolis or the eastern Delta (?),[125] and Bubastis (year 23),[126] as well as on a statue of uncertain provenance.[127] This has been interpreted as being two different kings with the same prenomen and throne-name, [128] but this is hardly plausible.[129] The idea that both the UE and LE Petubaste would have the same highest known date of 23 years appears rather suspicious. In addition, one of the Theban retainers of Petubaste, the

[120] Nile level record no. 26, cf. Beckerath (n. 3), 52.

[121] In *TIP*, § 448; cf. also Aston (n. 31), 151. Against this, one could argue that all of the other synchronisms in the Nile level records give only the links between the rulers of one "party" to the LE king (Shoshenq III). If Iuput I was the successor of Takelot II, he should have belonged to the foes of Petubaste. However, from the Chronicle of Prince Osorkon (B,7ff.) it is evident that at this time, there was a temporary unity among the various rivals in the civil war (cf. Jansen-Winkelen [n. 19], 140–141 on this).

[122] Abbreviations: NLR, Nile Level Records, cf. Beckerath (n. 3), 43–55; OC = Caminos, *Chronicle*; OC, A = *Reliefs*, III, pl. 16–19; B = ibidem, pl. 21; C = ibidem, pl. 22; AP = Annals of the Priests at Karnak, cf. Legrain (n. 4), 51–63; Kruchten, *Annales*; Stela 22.8.26 = Meeks, *Donations*, 669 [22.8.26]. Years in brackets are postulated.

[123] Nile level record no. 24; Beckerath (n. 3), 51.

[124] Cairo JE 45530, cf. Schulman, *JARCE* 5 (1966), 33–41; pl. 13.

[125] Copenhagen Ny Carlsberg AEIN 917, cf. O. Koefoed-Petersen, *Recueil des inscriptions hiéroglyphiques*, pl. 5; J. Yoyotte, *BIFAO* 58 (1959), 97 (2); Meeks, *Donations*, 671 (23.1.00).

[126] Florence 7207, cf. R. A. Caminos, *Centaurus* 14 (1969), 42–46; pl. 1–2.

[127] Gulbenkian Museum Lisbon, cf. M. Hill, Royal *Bronze Statuary from Ancient Egypt* (Leiden/Boston, 2004), 155–156; pl. 18 (12).

[128] E.g., A. S. Schulman, *JARCE* 5 (1966), 37–39; Beckerath, *GM* 147 (1995), 9–13.

[129] Cf. B. Muhs, *JEA* 84 (1998), 223; J.v. Beckerath in: *Es werde niedergelegt als Schriftstück: Festschrift für Hartwig Altenmüller zum 65. Geburtstag* (Hamburg 2003), 31–36.

Fig. II. 10.1

Dyn. 22	Dyn. 23 (UE)	Rival Kings	High Priests	Sources
Osorkon II			Harsiese B	CG 42225,a
	Takelot II			
Shoshenq III year (1)	(4)			
6	(9)		Harsiese B	NLR, no. 23
		Petubaste I		
(8)	11	(1)	Osorkon B	OC, A 18–53: 1st "rebellion"
(9)	12	(2)	Osorkon B	OC, B 1–6
12	15	5	Osorkon B/ Harsiese B	NLR, no. 24; OC, B 7: 2nd "rebellion"
(14)	(17)	7		AP, no. 1, 1.1
(15)	(18)	8	Harsiese B	AP, no. 1, 1.2; no. 2, 11.1/3
(21)	24	(14)	Osorkon B	OC, C 7 (cf. B 7–C1)
22	25 Iuput I (1)	(15)	Osorkon B	OC, C 12 (year 22); ASAE 4, 183
23	2	16	Osorkon B	NLR, no. 26 (y. 2/16); OC, C 12
24	(3)	(17)	Osorkon B	OC, C 13–16
25	(4)	18	Osorkon B/ Harsiese B	NLR no. 28; OC, C 1–2; 17: 3rd "rebellion"
26	(5)	19	Harsiese B	NLR, no. 27; Stela 22.8.26
28	(7)	(21)	Osorkon B	OC, C 12; 17
29	(8)	(22)	Osorkon B	OC, C 22
(30)	(9)	(23) Shoshenq IV	Takelot E	NLR, no. 29 Jacquet-Gordon, Graffiti, 85
(33)	12	(?)		
(?)	(?)	6	Takelot E	NLR, no. 25
39	(18)		Osorkon B	NLR, no. 22; PA, no. 7, 11.1–3
(39?)	Osorkon III (1)			

prophet of Amun and royal scribe *Ḥr* (IX), is unexpectedly documented at Memphis,[130] and perhaps also in Tell el-Balamun.[131] There can only be one single king Petubaste, who used the epithet *zꜣ Bꜣstt* in LE. He may have been a rival king who attempted to re-establish a unified kingship over the entire land, a situation which had ceased to exist at the very latest by Takelot II. Regardless, the "dynasty" of Petubaste is not chronologically relevant. It is not known when Shoshenq IV succeeded Petubaste, the length of whose reign is likewise unknown. This dynasty presumably ended in year 39 of Shoshenq III, at the latest.[132] By contrast, the dynasty of Takelot II can be followed: a year 12 is documented for his presumed successor, Iuput I (cf. above),[133] and his successor can only have been Osorkon B/III. He appears for the last time in year 39 of Shoshenq III, as High Priest. As he had this office since year 11 of Takelot II (= year 8 of Shoshenq III), and then reigned for 28 years as king, he must have become king in or shortly after year 39 of Shoshenq III. If he, as is probable, followed immediately after Iuput I, the latter must have reigned for at least 17 years.

For Osorkon III, the regnal years 1(?), 3, 5, 6, 14(?), 15, x + 6, 23(?) and 28 are documented, with his regnal year 28 being equal to year 5 of his son Takelot III,[134] the only completely unambiguous coregency in the TIP. [135] For Osorkon III, 23 full years can be accounted for, and for Takelot III, years 5, 6, and 7 are clearly attested.[136] If Osorkon

[130] K. Jansen-Winkeln, SAK 27 (1999), 123–139; pls. 1–4.

[131] A. J. Spencer, *Excavations at Tell el-Balamun 1995–1998* (London 1999), 13–15; 83–86; 90–91.

[132] In this year, the HPA Osorkon B claimed that he and his brother defeated all of those with whom they fought, cf. Legrain (n. 4), 55–56; Kruchten, *Annales*, pl. 4; 19. It would still be conceivable that the later "dynasty" of Hermopolis (Nimlot D and Thotemhat) continued that of Petubaste, as Hermopolis could have been a major center in Petubaste's "rebellion", cf. Jansen-Winkeln (n. 19), 142. However, there does not appear to be any trace of a temporal link between these regents.

[133] Aside from the graffito of year 9 of Iuput, the same priest also left graffiti from years 9 and 12 (without the name of a king), cf. Jacquet-Gordon, *Graffiti*, 84–85 (nos. 244–245).

[134] Nile level record no. 13; Beckerath (n. 3), 50. For the uncertain numbers, cf. Jacquet-Gordon, *Graffiti*, 41 (nos. 101: year 1); 68–9 (no. 190: year 14); 69 (no. 191: year 23).

[135] This conregency is also confirmed by the statue Cairo *CG* 42211, dated by the cartouches of *njswt-bjt Mrjj-Jmn zꜣ ꜣst Ṯkrt* and *zꜣ Rꜥ Mrjj-Jmn zꜣ ꜣst Wsrkn*, cf. Jansen-Winkeln (n. 63), 470.

[136] Daressy (n. 40), 51–52.

III ascended the throne in year 39 of Shoshenq III, then the temporal relationship between Dyn. 22 and the UE rulers of the line of Takelot II will have been that presented in Fig. III. 10.2. If he became king at a later date (year 40 or 41), then the dynasty must be pressed down a bit, but this can hardly be a matter of more than a few years.[137] Of his successors, only his well documented son Takelot III spatially and temporally anchored in Thebes. The length of the reign remains unclear: he is occasionally assigned a reign of more than 6 full years, and not least because several of his children were still alive shortly before 700 as the family trees of their descendents and the style of their tombs reveal.[138] F. Payraudeau has recently attempted to link a year 14 of a Takelot *z3 3st* in P. Berlin 3048 to Takelot III rather than Takelot II.[139] This is possible but by no means certain.[140] However long he reigned, the problem of the "generation shift" does not disappear: perhaps Takelot III and/or Osorkon III only became fathers late in their lives.

At the very latest, after the reign of Takelot III the situation in UE becomes quite obscure. At the time of the Piye campaign, the Nubians ruled the Thebaid, while other UE kings were in Hermopolis and Herakleopolis. The later successors of Osorkon III were thus driven out of Thebes. There is no clear indication of when this happened, but at the very latest the inauguration of Amenirdis I as the adoptive daughter and heir of the Divine Wife Shepenupet I marks that Thebes was definitely governed by the Nubians. According to Kitchen, it was Piye, the brother of Amenirdis, who ordered the adoption,[141] but Morkot

[137] On the condition that the HPA Osorkon B and Osorkon III were in fact one and the same person, cf. above, section 3.

[138] Cf. Aston & Taylor, in: Leahy, *Libya*, 138–143.

[139] *GM* 198 (2004), 82–85. Palaeographically it appears probable that on the same papyrus (debt note) one should read year 23 (rather than 13), cf. S. Vleeming, *OMRO* 61 (1980), 3, n. 14; B. Menu, *CRIPEL* 1 (1973), 89–90; K. Donker van Heel, in: K. Ryholt, ed., *Acts of the Seventh International Conference of Demotic Studies* (Copenhagen: CNI Publications 27, 2002), 142.

[140] The palaeography can hardly aid with the date as there are already very cursive texts in Dyn. 21, cf. M. Malinine, in: *Textes et langages de l'Égypte pharaonique* I (Cairo, 1973), 31. The identification of some ancestors of the scribe with individuals from dated contexts is unreliable in the extreme, or would even favour a date under Takelot II (as with the vizier *Ḥrj*). Nor can an argument be made using the Overseers of the Treasury, as four of them appear in this one Papyrus (cf. Donker van Heel [n. 139], 143).

[141] *TIP*, § 122.

Fig. III. 10.2 (Abbreviations: see Fig. III. 10.1)

Shoshenq III	Takelot II	
Year 1	Year 4	
21	24	
22	25	
	Iuput I	
	1	
33	12	
39	(18)	
	Osorkon III	
	1	
Shoshenq IIIa	2	
1		
13	14	
Pami	15	
1		
6	20	
7		
Shoshenq V		
1	21	
3	23	
4	24 =	1 Takelot III
8	28 =	5
10		7 (sole rule)

has convincingly shown that it was probably her father Kashta who installed her.[142] This would mean that the successors of Osorkon III were swiftly removed from Thebes. If Piye's campaign (in his year 20) took place within five years of the death of Shoshenq V (see below, section 7), then his reign must have begun at the latest in year 25 of Shoshenq V, and probably somewhat earlier. The inauguration of Amenirdis could thus have taken place in years 20–24 of Shoshenq V. As year 28 was probably the final year of Osorkon III, and corresponds to year 8 of Shoshenq V, at the earliest (cf. above), his successors have a mere 10–15 year in Thebes, before they had to withdraw to the North. All of their dated sources from Thebes must be assigned to this short period.

[142] In: S. Wenig, "Studien zum antiken Sudan", *Meroitica* 15 (1999), 194–196.

Aside from Takelot III, the following UE kings are known from the period after Osorkon III.

- Rudamun, the brother of Takelot;[143] no known regnal years.
- Peftjauʿawybast, the son-in-law of Rudamun, king of Herakleopolis at the time of Piye's campaign;[144] regnal year 10 is documented.[145]
- G. Broekman has recently shown that it is highly probable that there was an UE king Shoshenq ("VII") with the epithet *zꜣ ꜣst* and the throne-name *Ḥḏ-ḫpr-Rʿ Stp.n-Rʿ*,[146] who was recognized as king in Thebes in his regnal year 5,[147] and who is to be inserted after Shoshenq III and thus also after Takelot III.
- Another candidate would be the king Iny who is documented several times in Thebes (including a regnal year 5) and perhaps also in Abydos.[148]
- In addition, there is a dynasty residing in Hermopolis, whose most prominent member, Nimlot D, is chronologically anchored in the stela of Piye. His predecessor or (more probably) successor could have been Thotemhat,[149] and a later successor may have been Padinemti(?).[150]

[143] Cf. O. Perdu, *RdE* 53 (2002), 157–178, for this person.

[144] Even if his power was restricted to the Herakleopolis region, during this period when the Nubians controlled the Thebaid and there appeared yet another UE kingdom, he could still have been the heir of an UE dynasty with a much larger realm. In Herakleopolis and the surrounding area at least, the dynasty of Takelot II is well documented, e.g, the HPA Osorkon B (cf. Caminos, *Chronicle*, §§ 28–30) and the later Takelot III (*ASAE* 37 [1937], 16–24). Payraudeau's ([n. 139], 79–81) attempt to distinguish the general of Herakleopolis from the son of Osorkon III, who bears the same name, cannot be accepted in view of the fact that both are HPA and had a mother with the same rather uncommon name.

[145] Donation stelae Cairo JE 45948 and 11/9/21/14, cf. G. Daressy, *ASAE* 17 (1917), 43–45; *ASAE* 21 (1921), 138–139.

[146] Broekman (n. 3), 163–78, esp. 176–177.

[147] The only certain document is the Nile level record no. 3; Beckerath (n. 3), 49, hitherto assigned to Shoshenq I. However, one cannot exclude a possible reference to Shoshenq IIIa; his predecessor Shoshenq III is in fact mentioned in his last (or next to last) year in the Nile level records, cf. Broekman (n. 3), 176. It is conceivable that there was still resistance after Osorkon III ascended the throne, and that one of his enemies was able to establish himself briefly in Thebes, and dated according to the LE king. It is highly probable that the Nile level record no. 45 does *not* belong to Shoshenq VII (cf. Broekman [n. 3], 177); there does not remain any time for a year 17/19/25 of a sovereign in Thebes before the Nubians after Osorkon III (cf. above).

[148] J. Yoyotte, *CRIPEL* 11 (1989), 113–131; pl. 14.

[149] For him, cf. H. Wild, *RdE* 24 (1972), 209–215; P. Spencer & A. Spencer, *JEA* 72 (1986), 198–199; pl. 21; Bierbrier, *LNK*, 84.

[150] For him most recently, cf. A. Leahy, *JEA* 85 (1999), 230–232.

As the brother of Takelot III, Rudamun was most probably his successor, as is generally assumed. It is, however, remarkable, that he is better documented in Hermopolis than in Thebes.[151] It is thus also conceivable that Rudamun became king in Hermopolis after the death of his father, alongside his brother Takelot in Thebes (and Herakleopolis?). The Libyan period does reveal a tendency to multiply both rulers and principalities. The line of Takelot would then have been reduced to Herakleopolis after the Nubian intervention. Shoshenq "VII" is only documented in Thebes, with a year 5. He too can belong only to the dynasty of Osorkon III (as a son of Takelot III?). If Rudamun was the successor of Takelot III (in Thebes), Shoshenq VII would most probably have been a successor of Rudamun, although a sequence of Takelot—Shoshenq—Rudamun cannot be excluded.[152] If Rudamun was a local ruler in Hermopolis, then Shoshenq VII would have followed immediately after Takelot. The year 5 of king Iny should be situated roughly two generations after year 4 of a king Shoshenq;[153] and this may have been Shoshenq III, IV or VII. Were it Shoshenq III, the reign of Iny would fall under the reign of Osorkon III, and that is improbable. Otherwise, he should be assigned either to the period after Takelot III (successor of Shoshenq VII?), or indeed placed in Dyn. 25. Unusually his name was effaced, and thus he might have been a pretender (during the reign of Osorkon III or Dyn. 25),[154] in which case the reign would be of no chronological relevance.

In any case, the rulers of the house of Osorkon III were swiftly evicted from Thebes. The Peftjauʿawybast of Herakleopolis named on the stela of Piye is the last of this line. The "dynasty" of Hermopolis (whether from Rudamun or by another line) may have been founded by descendents of Osorkon III, but it could equally easily have been the late revival of the rival dynasty of Petubaste.

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[151] Cf. Perdu (n. 143), 169–170.

[152] Cf. G. Broekman, "The Chronological Position of King Shoshenq Mentioned in Nile Level Record No. 3 on the Quay Wall of the Great Temple of Amun at Karnak", *SAK* 33 (2005), 75–89.

[153] Graffito no. 11 from the roof of the temple of Khonsu, cf. H. Jacquet-Gordon, in: *Hommages à la mémoire de Serge Sauneron* I (Cairo, 1979), 174–183; pl. 27–28; Yoyotte (n. 148), 115.

[154] Cf. Yoyotte (n. 148), 131. A "reign" of at least 4 years for a rival king could be possible, but it would be quite unusual, and particularly so in Dyn. 25.

The chronology of the UE kings after Osorkon III thus remains quite uncertain: there are only a few (low) dates, and it is unclear which kings reigned in parallel and which in succession. Of the kings attested on the stela of Piye, Nimlot D cannot be linked to either a predecessor or a successor,[155] and Peftjauʿawybast can only be identified genealogically as the son-in-law of Rudamun.

The familiar "graffito" from Wadi Gasus could offer a chronological connection with the following Dyn. 25.[156] To the right is the cartouche of the Divine Adoratrice Amenirdis (I), above which is regnal year 12, to the left the cartouche of the Divine Wife Shepenupet (I), above which is regnal year 19, both names have the epithet "living" (*ʿnḫ.tj*). It is today agreed that the year 12 of Amenirdis can only be related to Piye,[157] and thus the year 19 should be assigned to one of the UE rulers recognized by Piye. It is thus immediately clear that Takelot III cannot possibly be the king designated by the year 19 of the graffito[158] since his year 19 must have corresponded to year 22(–25, or so) of Shoshenq V (cf. above, Fig. III. 10. 2), and thus clearly before year 12 of Piye in whose year 20 the campaign to the North took place, Shoshenq V, who reigned at least 37 years, no longer in office.

Rudamun would only be a candidate for the year 19 if he was not the predecessor of Shoshenq VII, as they were certainly not dating in Thebes according to the dynasty of Osorkon III 19 + 5 years after Takelot III (cf. above). The year 19 can also be linked to Shoshenq VII or Peftjauʿawybast. In any case, it should certainly be someone relatively close to Piye's house: an ally. Nimlot D of Hermopolis would thus also be a candidate. He appears in an ambivalent fashion on the stela of Piye: on the one hand the Nubian king expresses his particular irritation over the alliance with Tefnakhte of Sais, while on the other, he is given preferential treatment.[159] This can be most easily explained by the fact that he was an ally of the Nubians who then

155 No regnal year is preserved, and the same is true of several other members of this dynasty: Rudamun, Thotemhat, and Padinemti; for the latter two, not even the exact position in the sequence of the "dynasty" is known.

156 L.-A. Christophe, *BIE* 35 (1952/53; 1954), 141–152.

157 *TIP*, §§ 143–145.

158 Thus Payraudeau (n. 139), 85–86.

159 He is the only prince admitted into the Palace to Piye, cf. the great stela of victory, ll. 148–53 (*Urk.* III, 54) and is the only one pictured standing, but actually like a woman, with a sistrum in his hand.

switched sides.[160] As an ally before these events, he would have been a suitable candidate for the double dating, and in fact he does appear a second time with the Divine Wives Shepenupet I and Amenirdis I.[161] Nimlot D thus appears to me to be a particularly suitable candidate for the year 19 in this graffito. Chronologically, however, this does not aid at all: in temporal terms, neither Nimlot D nor the other possible candidates can be pinned down to sufficiently narrows slots in time so as to allow a direct link with between the house of Osorkon III and Dyn. 25.

A somewhat more precise knot making a temporal link between the Libyan and Nubian periods is possible only via Dyns. 22 and 24, and possible fixpoints can only be gained for Dyn. 25.

6. *The Chronological Framework for Dyn. 25*

The beginning of the reign of Taharqa lies in year 690 BC, and this is not disputed.[162] For a long time, his predecessor Shebitku (highest date is year 3[163] was assigned a reign of 8–12 years, and at the most 13 regnal years.[164] However, the inscription of Sargon II at Tang-i Var reveals that Shebitku was already (at the latest) king in 706,[165] and thus reigned for at least 16 years. As his predecessor Shabaka ruled for at least 14 full years (cf. below), the beginning of his reign would be at the latest in 720 BC. Since one had once assumed that there were good reasons for believing that the Nubian rule in Egypt could not have begun before 716 or indeed 712 (cf. below), it was suggested a number of times that Shebitku was only (co)regent in Nubia while his senior partner, Shabaka (with dates according to his reign) ruled in Egypt.[166] This is historically quite improbable, aside from the fact that there has never been the slightest hint at any form of coregency of the

[160] Opposing D. Kessler, *SAK* 9 (1981), 238.

[161] On the fragment of a vessel in the Museo Barracco in Rome, cf. L. Bongrani Fanfoni, *OrAnt* 26 (1987), 65–71; pls. 2–3.

[162] Cf. *TIP*, §§ 130–131; Beckerath, *Chronologie*, 91.

[163] Nile level record no. 33, cf. most recently J.v. Beckerath, *GM* 136 (1993), 7–9.

[164] *TIP*, §§ 126; 468; Beckerath, *Chronologie*, 92.

[165] G. Frame, *Orientalia* 68 (1999), 31–57; cf. D. Kahn, *Orientalia* 70 (2001), 1–3. Cf. also N. Na'aman, *N.A.B.U.* 1999, Nr. 3, 63 (65).

[166] So Redford, *Orientalia* 68 (1999), 58–60; Beckerath, *SAK* 29 (2001), 3–6; Kitchen, in: Bietak, ed., *SCIEM Haindorf 1996/98*, 50–51.

Nubian kings of Dyn. 25. Had Shabaka been ruler of Egypt in the year 707/706 and Shebitku his "viceroy" in Nubia, one would definitely expect that the opening of diplomatic relations with Assur as well as the capture and extradition of Yamani would have been part of Shabaka's responsibility. Sargon can also be expected to have named the regent of Egypt and senior king, rather than the distant viceroy Shebitku. If, on the other hand, Shebitku was already Shabaka's successor in 707/706, the reports of the Yamani affair become clearer and make more sense. It had hitherto been assumed that the Nubian king (Shabaka) handed over Yamani more of less immediately after his flight to Egypt.[167] Now it appears to be certain that Yamani was only turned over to the Assyrians a couple of years later.[168] It then becomes much more probable that Shabaka awarded him asylum, but that Shebitku did not feel bound by his predecessor's word and that he desired to make a gesture of good will towards the Assyrians at the start of his reign, and that he extradited Yamani.[169] This interpretation also matches with the peculiar insertion into Sargon's large "ceremonial inscription" in Khorsabad where the king of Nubia is described as residing in a very distant, inaccessible land.[170] The formulation of his Nile level record (no. 33) also supports the idea that Shebitku only came to Egypt in his year 3.[171]

Shabaka must, therefore, have already been dead in 707/706. The "international" reasons which have hitherto been used to justify placing his reign in Egypt after 716 or even 712 cannot therefore be correct, and in fact they are wrong. The events of the years (around) 725 (when Hosea of Israel addresses an appeal for aid to a "So, King of Egypt")[172] and around 720 (when an unknown Egyptian sovereign sends a general named Re'e leading an army into Palestine to support a revolt against the Assyrians only to be defeated at Raphia),[173] are not

[167] Cf. e.g., *TIP*, § 341.

[168] Cf. A. Fuchs, "Die Annalen des Jahres 711 v. Chr," *State Archives of Assyria Studies* VIII, 127–31. The actual text of the Assyrian reports recording that Yamani lived in Egypt "like a thief" likewise indicate a prolonged stay.

[169] Had Shabaka himself extradicted Yamani after having granted him asylum for years, that would have been an inconvertible sign of weakness.

[170] A. Fuchs, *Die Inschriften Sargons II. aus Khorsabad* (Göttingen 1994), 221–222; 348–349; Frame (n. 165), 53.

[171] Cf. Beckerath (n. 163), 7–9.

[172] 2 Kgs. 17,4.

[173] Annals of Sargon II from Khorsabad, ll. 53–5, cf. Fuchs, *Inschriften*, 90; 315; cf. also the threshold inscriptions from Khorsabad, ll. 38–41, ibidem, 262; 360; and a clay cylinder from Khorsabad, l. 19, ibidem, 34; 290.

relevant for the dating of the Nubian rule in Egypt.[174] In the year 716, Sargon II extends his sphere of control further south, and receives tribute (or the like) "from Pharaoh, the king of the Land of Egypt".[175] Another source is more precise, recording that Shilkanni, the king of Egypt, sent 12 large steeds as a greeting present.[176] Shilkanni could be Osorkon IV,[177] but he is in any case a LE and not a Nubian king. In the case of the Yamani-affair (711–706)[178] the city of Ashdod asks "Pharaoh, the king of Egypt, a prince, who could not rescue it" for an alliance, apparently in vain. As the Assyrians attack, Yamani flees "to the border of Egypt in the area of Nubia",[179] where he lives "(secretly) like a thief", until extradited by Shebitku. Neither the events of 716 nor 711 can possibly serve as a *terminus post quem* for the beginning of Nubian rule. The pharaoh whose alliance was requested in 712/711 can only be either Shabaka or a Delta Prince, but even in the latter case, it would not imply that Shabaka had not yet been recognized in Memphis. Shilkanni apparently had good reasons for trying to reassure the Assyrians; but this does not solve the issue of who had the upper hand in Egypt. In the account of his third campaign, Sennacherib reports that at the battle at Eltekeh (701), Hezekiah made appeals to "the kings of Egypt" *and* the troops of the King of Nubia (Shebitku). On this occasion, the Assyrian king captured "the charioteers and the sons of the kings of Egypt" *and* "the charioteers of the king of Nubia".[180] From the Assyrian point of view, the enemies are perceived primarily as a kind of coalition, and this may have correspond to the facts, for

[174] There is one hint that Nubian soldiers took part in the battle at Raphia (cf. Kahn, *Orientalia* 70, 11–12), but these could have been mercenaries.

[175] Annals of Sargons II from Khorsabad, ll. 123–4, cf. Fuchs, *Inschriften* 110; 320.

[176] Assur Prisma, cf. Fuchs, *Annalen*, 28–29; 57.

[177] This is, however, by no means certain, a name such as *Šrkn* or the like would be more reasonable, cf. J. Yoyotte, *Kêmi* 21 (1971), 51–52.

[178] Mentioned in the following inscriptions: Annals of Sargon II from Khorsabad, ll. 241–254, cf. Fuchs, *Inschriften*, 132–5; 326; small ceremonial inscription from Khorsabad, ll. 11–14, cf. Fuchs, *Inschriften*, 76; 308; *Orientalia* 68 (1999), 52–53; large ceremonial inscription from Khorsabad, ll. 90–112, cf. Fuchs, *Inschriften*, 219–222; 348–9; *Orientalia* 68, 53; Niniveh Prisma VIIB, cf. Fuchs, *Annalen*, 44–6; 73–4; inscription from Tang-i Var, cf. Frame (n. 165), 31–57.

[179] This frequently discussed phrase (cf. most recently L. Depuydt, *JEA* 79 [1993], 272, n. 24; Fuchs, *Inschriften*, 220; 348; 452; Frame (n. 165), 52, n. 24) seems to mean something like "to that part of Egypt, which was under the direct control of the Nubians".

[180] Cf. E. Frahm, "*Einleitung in die Sanherib-Inschriften*", *AfO* Beiheft 26 (1997), 54; 59. On the 3rd campaign of Sennacheribs as a whole, cf. ibidem 10–11.

even under Asarhaddon and Assurbanipal the princes of the Delta are represented as acting independently on the international stage. It is thus inadmissible to use evidence of such activities as a base for defining the beginning of Dyn. 25.

There are no obstacles to ending the reign of Shabaka in 706 at the latest; on the contrary, everything suggests that Shebitku ruled alone from 707/706 to 690. Year 2, 3, 4, 6, 10, 12, 13, 14, 15[181] are documented for Shabaka, and he is generally assigned 14 full years. An indirect confirmation of this can be found in Manetho, if one allows for a slip,[182] by assigning the 14 years Africanus gives to Shebitku to Shabaka. However, in view of the unreliability of the Manetho tradition concerning Dyn. 25[183] this does not mean much. A possibility for calculating can also be deduced from two stelae from Kawa where Taharqa states that he was 20 years old when Shebitku called upon him to go from Nubia to Egypt.[184] As this will doubtless have taken place in the course of the preparations for the campaign which led to the battle at Eltekeh where Taharqa saw action,[185] he must have been born ca. 722/721. If he was a son of Piye's (as is generally assumed),[186] the latter must have lived until at least 723 and perhaps a bit longer.[187] However, it is by no means certain that Taharqa was really the biological brother of Shepenupet II and thus the son of Piye.[188] Nevertheless, a reign of 14–15 years for Shabaka remains highly probable. Favouring this is also the fact that there is a relatively complete coverage of dates from the second decade of his reign (10, 12, 13, 14, 15), and a large hole would be improbable. He must thus have come to the throne at the latest in 720, or more probably 721 or 722. His second year would thus be ca. 720 (721–719), and also year 6 of Bocchoris.[189] It is calculating

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[181] Block statue BM 24429, cf. Leclant, *Enquêtes*, 15–27; pl. 5–6.

[182] Thus Beckerath, *Chronologie*, 92; *TIP*, § 421.

[183] Cf. *TIP*, § 468.

[184] Stela IV, ll. 7–9; V, ll. 16–7, cf. Macadam, *Kawa* I, 15; 28; pl. 7–10.

[185] *TIP*, § 127–9; 133.

[186] According to the stela of Nitokris, ll. 3–4 (cf. *JEA* 50 [1964], 74; pl. VIII) the Divine Wife Shepenupet II, a daughter of Piye, was his sister, cf. *TIP*, §§ 120–121.

[187] Cf. D. Kahn, *Orientalia* 70 (2001), 7.

[188] Cf. A. Leahy, *GM* 83 (1984), 43–45.

[189] An inscription from year 2 of Shabaka was found in the Serapeum, and this—despite some inconsistencies in the secondary literature—should be related to the same Apis burial as the stelae from the beginning of year 6 of Bocchoris, cf. *TIP*, § 114; J. Vercoutter, *Kush* 8 (1960), 62–67; *PM* III^2, 789. That year 2 of Shabaka was either the same as, or close to, year 6 of Bocchoris is clear from the sources: Manetho assigns

the regnal years of Piye, the predecessor of Shabaka, which is uncertain, and thus likewise the link to the major campaign of year 20.[190] In Egypt, the years 20(?), 21, 22, and 24 are documented,[191] but he is generally assigned a reign of 31 years as a few years must be inserted for Tefnakhte before the reign of Bocchoris his successor. This rests on the correct assumption that the various rulers of Egypt listed on the stela of Piye are actually identified by their rightful titles—including the foes of the Nubian king. If Tefnakhte is not designated a king there,[192] he will thus have become such only after the campaign of Piye. As a year 8 is recorded for Tefnakhte as king,[193] at least an additional 7 years must have passed between Bocchoris's accession to the throne (ca. 725, cf. above) and the campaign of Piye,[194] and thus the campaign will have taken place shortly before ca. 732, perhaps 733/734. This is possible, but not compelling. Tefnakhte's predecessors were not kings,[195] and on two donation stelae from years 36 and 38 of Shoshenq V—certainly only a few years before the campaign of Piye[196]—he himself does not yet bear the royal title,[197] and dates himself according to

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Bocchoris 6 years (following Africanus), and reports that Shabaka burnt him alive. Shabaka himself is only known in Egypt (even LE) in his regnal year 2.

[190] Only the erection of the stela with the record of this campaign is dated, in the first month of year 21. It is generally agreed that the campaign must have taken place in the previous year.

[191] *JEA* 54 (1968), 165–172; pl. XXV; for the alleged year 30 on the mummy wrapping London BM 6640 cf. D. B. Redford, *JARCE* 22 (1985), 9–12; figs. 1–2, according to which it can be read as either 20 or 40.

[192] In ll. 19–20 he is named "Great Prince of the West", along with a few of his other titles; in general, however, he is merely the "Chief of the Ma" (ll. 28; 80; 126).

[193] A hieratic donation stela in Athens, cf. R. el-Sayed, *Documents relatifs à Saïs et ses divinités*, *BdE* 69 (1975), 37–53; pl. 7. K.-H. Priese (*ZÄS* 98 [1972], 19–21) and K. Baer (*JNES* 32 [1973], 23–24) have disputed that the king Tefnakhte with the throne-name *Špss-Rꜥ* is the same as the Prince Tefnakhte on the stela of Piye. They assume instead that this is the first king of Dyn. 26 (before the predecessor of Neco I) mentioned by Manetho ("Stephinates"), and thus a local prince of Sais. Opposing this stance is the fact that one of the stelae of *Špss-Rꜥ* Tefnakhte actually probably comes from the eastern Delta (cf. Yoyotte [n. 177], 37–40), which was most assuredly not under the control of the local princes ruling in Sais during Dyn. 25. Furthermore, Diodor (I, 43) specifies that the *king* Tefnakhte, predecessor of the sage Bokchoris, undertook an expedition to "Arabia", and this would only have been possible from the eastern Delta.

[194] The possibility that Tefnakhte only became king after the campaign, but that his regnal years were then post facto extended back to a point in time before the campaign is rejected by Kitchen (*TIP*, § 112).

[195] J. Yoyotte, *BSFE* 31 (1960), 13–22; *TIP*, § 113; 468.

[196] Cf. above, section 4.

[197] The unusual designation, "Great Prince of the Entire Land" reveals that his ambition (and certainly also his power) extended far beyond that of the ordinary Libyan local princes.

Shoshenq V. If he became king shortly thereafter, e.g., after the death of Shoshenq V, this could only have taken place on the basis of his own power. As one very conscious of legitimacy, Piye would thus not have had the slightest reason to have designated someone as a king if that person had only just shortly before proclaimed himself king, and even less so if this person was his major opponent.[198] It would thus be possible to set the campaign of Piye somewhat closer to the accession of Bocchoris, perhaps, between 734 and 726 BC; his accession to the throne would thus be ca. 753–745 BC.

7. *Connecting Dyns. 22 and 25*

Shoshenq V died before the campaign of Piye, but not long before, since Tefnakhte claims the title "Great Prince of the Entire Land" in year 38. On the other hand, however, Shoshenq's rule was apparently uncontested in Memphis in his year 37, and thus Tefnakhte's expansion was not as advanced as at the beginning of the campaign of Piye. In addition, there may be another king Petubaste (cf. above) to insert before Osorkon IV who reigned in Bubastis and Tanis during the campaign. A period of about 5 years between the death of Shoshenq V and year 20 of Piye would appear reasonable.

For the kings from Shoshenq I to Takelot I we can reckon at least 21 + 35 + 15 years, for Osorkon II at least 30 years, as a year 29 is very probably documented and the genealogical data favours a long reign (cf. above, section 1). For the kings Shoshenq III, Shoshenq IIIa, Pami and Shoshenq V, we have made a minimal period of 95 years (cf. above, section 3). If we start with year 945 as the beginning of Dyn. 22, the year 38 of Shoshenq V is to be set in 749 *at the earliest.* The campaign of Piye can be placed in the years 734–726 (cf. above, section 6); 10–18 years would remain to bridge the period between the campaign and year 38 (+ 5) of Shoshenq V. This result is also realistic as those reigns the duration of which is not certain were assigned minimal values here. Where these missing years must be placed is a

[198] On his "small stela" (Khartoum 1851, G. A. Reisner, *ZÄS* 66 [1931) 89–100; pls. V–VI) Piye clearly enunciates that only that person is king whom he makes king, and not those whom he forbids. This could apply to Tefnakhte, nor does he call Tefnakhte "Great Prince of the Entire Land", but rather "Chief of the Ma".

matter of speculation, but there are several possibilities.[199] First of all, the year 945 is not certain. If the campaign of Shoshenq in Palestine (926/925 in year 5 of Rehabeam) did not take place in his year 20, but rather a few years earlier—as is entirely possible[200]—the beginning of the reign must accordingly be placed somewhat later. Candidates for a somewhat longer reign are Shoshenq V himself and Osorkon II. Likewise, Pami may have reigned for more than 6 years,[201] if his "annals" were not written posthumously (cf. above, section 3), and Osorkon I and his successors could have ruled longer than we have assumed above.[202] In any case, a very slight extension of a few reigns is just as unproblematic as setting the beginning of Dyn. 22 marginally later in history.

8. *Conclusion*

For the chronology of the TIP, Egyptian sources only supply the year 690 as a certain point of departure. Additionally, the date of the campaign of Shoshenq I, presumably towards the end of his reign, can be placed with the aid of Near Eastern chronology in 925/926.[203] Between these two there is not one single firm date, but the sequence of kings and the highest known dates for these kings does not leave significant gaps. The general framework of the chronology of this age is certain. Additional finds of dated monuments from this period will hopefully add to the previous discoveries, and lead to an even higher degree of resolution, leaving still less uncertainty.

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[199] Assigning the entire sum of years to the reign of Osorkon II, as Aston (n. 31; 145–148) does, is not necessarily the most logical possibility.

[200] Cf. above, Jansen-Winkeln, Chapter II. 9.

[201] Beckerath, *Chronologie*, 98, assigns him 11 years.

[202] The usual numbers still depend to a great extent upon the very doubtful figures for this period provided by the copyists of Manetho.

[203] Cf. above, n. 200. Following alternative and acceptable calculations in OT studies, the year 5 of Rehabeam would not have been 926/5, but rather 922/1 (H. Donner, *Geschichte des Volkes Israel und seiner Nachbarn in Grundzügen*, 2 [1995], 274); and this would correspond to the Egyptian dates quite well. A "chronological problem" noted by Donner ibidem, 321, n. 14) does not exist in this fashion: the Egyptian chronology is absolutely dependent upon Near Eastern chronology. If one follows Begrich/Jepsen and not Thiele, one simply shifts the accession of Shoshenq I by the same margin.

II. 11 SAITE AND PERSIAN EGYPT, 664 BC–332 BC (DYNS. 26–31, PSAMMETICHUS I TO ALEXANDER'S CONQUEST OF EGYPT)

Leo Depuydt

In the period at hand, events can dated exactly in absolute terms, that is, in relation to the present moment in time. Thus, the death of Psammetichus II in Month 1 Day 23 of his Year 7, that is, on 9 Feb 589 BC, is separated from the same time of day (whatever it was) on 1 Jan AD 2003 by 946311 full days or 24-hour periods. Chapter III. 11 outlines the general principles of day-exact chronology, with references to contributions that provide more detail.[1] In terms of chronological structure, the period has three natural subdivisions, each with its own anatomy: (1) Dyn. 26, the Saite dynasty; (2) Dyn. 27, consisting of Persian rulers; and (3) the fourth century BC up to Alexander's conquest of 332 BC, when Egypt was independent yet in Persia's sphere of influence. Accordingly, the following three equations have been obtained in fundamentally different ways.

1. Year 7 Month 1 Day 23 (I *ꜣḫt* 23) of Psammetichus II = 9 Feb 589 BC
2. Year 15 Month 4 Day 16 (16 Hathyr) of Xerxes I = 4 Mar 471 BC
3. Year 16 Month 8 Day 21 (21 Pharmouthi) of Nectanebo II = 5 Jul 343 BC

The structural hierarchy of the chronology of Dyns. 26–31 is as follows. Dyn. 27 is most secure, ultimately owing to synchronies with Mesopotamia established through Babylonian astronomical texts. As the anchor, Dyn. 27 is treated here first. Dyn. 26 depends on Dyn. 27 and is reasonably secure. It is treated next, along with Taharqa's reign, the last of Dyn. 25, which depends on Dyn. 26. The fourth century BC is best seen as a gap to be bridged between Dyn. 27 and Alexander's conquest of 332 BC. It is only partly day-exact.

[1] For a brief outline, see Beckerath, *Chronologie*, 79–88, with supplements in L. Depuydt, *WdO* 30 (1999), 143–51, a review. See also H.-J. Thissen, "Chronologie der frühdemotischen Papyri", *Enchoria* 10 (1980), 105–25.

1. *Dynasty 27*

The four pioneers who in the more recent past have done the most to cement the chronology of Egypt in 664 BC–332 BC by consolidating Dyn. 27 as its anchor are E. Meyer, R. A. Parker, A. Sachs, and above all F. X. Kugler.[2] By manipulating (1) Ptolemy's Canon, (2) predating of postdating, and (3) the cuneiform record,[3] the following approximate dates for the beginnings of the reigns are obtained. Details follow in the notes to the table in section 4. Day dates derived from ancient lunar dates can be one to two days off.

Cambyses	Aug 530 BC
Darius I	29 Sep–22 Dec 522 BC
Xerxes I	late Nov 486 BC
Artaxerxes I	5 Aug 465 BC–2 Jan 464 BC
Darius II	25 Dec 424 BC–13 Feb 423 BC
Artaxerxes II	18 Sept 405 BC–9 Apr 404 BC

Babylonian regnal Year 1 began on the first Babylonian new year following these dates (see 1.2 in Chapter III. 11), that is, around the spring equinoxes of 529, 521, 485, 464, 423, and 404 BC. The numberless period lasting from the beginning of the reign to the first Babylonian new year may be called the accession year. The above dates can be translated as follows into reign lengths detailing years only.

Dyn. 27	527–525	–	ca. 400
Cambyses (second half of reign)	527–525	–	522
Darius I	522	–	486
Xerxes I	486	–	465
Artaxerxes I	465	–	424/3
Darius II	424/3	–	405/4
Artaxerxes II (beginning of reign)	405/4	–	ca. 400

En-dashes (–) denote time-periods. Slashes (/) mark ancient calendar-years straddling two Julian years.

[2] Pioneering contributions are: E. Meyer, *Forschungen zur Alten Geschichte*, II: *Zur Geschichte des fünften Jahrhunderts v. Chr.* (Halle, 1899); F. X. Kugler, *Sternkunde und Sterndienst in Babel* (Münster, 1907–24); R. A. Parker, "Persian and Egyptian Chronology", *AJSL* 58 (1941), 285–301; id., "Darius and His Egyptian Campaign", *AJSL* 58 (1941), 373–377; Parker & Dubberstein, *Chronology*; A. Sachs's work on the Babylonian diaries.

[3] See sections 2.1, 1.2, and 2.3 in Chapter III. 11.

2. *Dynasty 26*

The main structural feature of the day-exact chronology of Dyn. 26 is its dependence on the day-exact chronology of Dyn. 27. Already in the nineteenth century AD, data from Greek historians and Serapeum stelae (see 2.2 in Chapter III. 11) had fixed the reigns of Dyn. 26 absolutely to within one or two years. In the 1950s, two contributions by R. A. Parker pushed the limit of day-exact chronology back from 525 BC in two moves: (1) from 525 BC back to 664 BC; (2) from 664 BC back to 690 BC. Each move rests on a single piece of evidence.[4]

(1) A civil-lunar double date deciphered jointly by M. Malinine and R. A. Parker at Brown University in a photograph of the abnormal hieratic papyrus Louvre 7848 equates civil Month 10 Day 13 (II *Shemu* 13) with lunar Month 9 Day 15 (I *Shemu* 15) in Year 12 of Amasis. Lunar Day 15 ought to fall around full moon. Before this date surfaced, Amasis's Year 12 had mostly been equated with the 365-day year 10 Jan 558 BC–9 Jan 557 BC, in which civil Month 10 Day 13 equals 19 October. However, 19 Oct 558 BC is not close to full moon. In the preceding Egyptian year, 10 Jan 559 BC–9 Jan 558 BC, civil Month 10 Day 13 also equals 19 Oct. and 19 Oct 559 BC does occur near the full moon of 21 Oct 12:09PM.[5] The earlier Egyptian year is therefore in all probability Amasis's Year 12.[6]

This backward shift of Amasis's regnal years affects the dating of Cambyses's conquest. Traditionally, the conquest had been dated to spring 525 BC and Amasis's Year 44 had been considered his last. But now, Day 1 of Year 44 was moved back from 2 Jan 526 BC to 2 Jan 527 BC. To keep the end of Amasis's reign close to the conquest, R. A. Parker postulated an unattested Year 45 for Amasis beginning on 2 Jan 526 BC. However, postulating a Year 45 was rendered unnecessary when the arguments dating the conquest to spring 525 BC.

[4] A passage in Demotic papyrus Berlin 13588 that has been interpreted variously as a solar eclipse (E. Hornung, "Die Sonnenfinsternis nach dem Tode Psammetichs I", *ZÄS* 92 (1966), 38–9) and as a lunar eclipse (M. Smith, "Did Psammetichus I Die Abroad?", *OLP* 22 (1991), 101–9) has possible chronological relevance (see also L. Depuydt, "On the Consistency of the Wandering Year as Backbone of Egyptian Chronology", *JARCE* 32 (1995), 43–58, at 53, note 50); for a different view, see Chapter III. 4.

[5] Goldstine's time, *Moons*, 37, for Babylon, minus 47 minutes for Thebes.

[6] R. A. Parker, "The Length of Reign of Amasis and the Beginning of the Twenty-sixth Dynasty", *MDAIK* 15 (1957), 208–12. pLouvre 7848 has now been published by K. Donker van Heel, *Abnormal Hieratic and Early Demotic Texts Collected by the Theban Choachytes in the Reign of Amasis* (Leiden, 1995), 93–99.

became invalid. The conquest is now better dated more imprecisely to 527–525 BC.[7]

(2) Serapeum stela Louvre IM 3733, the official epitaph of an Apis bull born in Taharqa's Year 26 and deceased in Psammetichus I's Year 20 pushes day-exact chronology back further from 664 BC to 690 BC.[8] Accordingly, Taharqa would have counted his reign from some day in the Egyptian year 12 Feb 690 BC–11 Feb 689 BC. The year 12 Feb 691 BC–11 Feb 690 BC is also a possibility. This window of doubt exists because IM 3733 lacks certain information: (1) the months and days of the bull's life-span, given as 21 years; (2) the month and day of his birth in Taharqa's Year 26; and (3) the year of his day of installation, which was Month 8 Day 9.[9] The lengths of the reigns of Dyn. 26 are as follows. Details follow in the notes to the table in section 4.

Dyn. 26	664/3	–	ca. 527–5
Psammetichus I	664/3	–	610
Necho II	610	–	595
Psammetichus II	595	–	589
Apries	589	–	570
Amasis	570	–	527/6
Psammetichus III?	some (6?) months in 527–525?		

En-dashes (–) denote time-periods. Slashes (/) mark ancient calendar-years straddling two Julian years.

3. *Dynasties 28 to 31*

The main structural feature of the chronology of Egypt in the fourth century BC up to Alexander's conquest of 332 BC is that it is partly day-exact. This feature deserves attention first. The evidence is in Nectanebo's Dream, which prophesies the demise of Egypt's last native ruler. The king of the Greek version had been identified with Nectanebo II,

[7] For a detailed discussion, see L. Depuydt, "Egyptian Regnal Dating under Cambyses and the Date of the Persian Conquest", in: *Studies in Honor of William Kelly Simpson* (Boston, 1996), 179–190, at 184, note 23. See now also J.v. Beckerath, "Nochmals die Eroberung Ägyptens durch Kambyses", *ZÄS* 129 (2002), 1–5; and E. Cruz-Uribe, "The Invasion of Egypt by Cambyses", *Transeuphratène* 25 (2003), 9–60, at 54–57.

[8] R. A. Parker, "The Length of Reign of Taharqa", *Kush* 8 (1960), 267–269.

[9] For details, see Depuydt, *JARCE* 32, 52–53.

not Nectanebo I, but it took a Demotic fragment to confirm this definitively.[10] In the Greek version in papyrus Leiden I 396, the Dream is dated to the night from 21 to 22 Pharmouthi (Day 21 to Day 22 of Month 8) of Nectanebo II's Year 16.[11] It was about full moon (κατα θεον δια δεχομενιαν). The lunar date can be identified with the help of Manetho's king-lists. In Manetho,[12] about 72 to 74 years separate the end of the reign of Darius II in 405/4 BC from Alexander's conquest of 332 BC. Nectanebo II's Year 16 is therefore about 62 years away from 405/4 BC, or falls about halfway between 345 BC and 340 BC. By far the closest match for the combination of full moon with 21/2 Pharmouthi falls in 343 BC. In this year, 21/2 Pharmouthi equals 5/6 Jul 343 BC. Full moon occurred about noon of 6 July.[13] The following equations result. Details follow in the table in section 4.

Nectanebo II Year 1	21 Nov 359–20 Nov 358
Nectanebo II Year 2	21 Nov 358–19 Nov 357
And so on	
Nectanebo II Year 19	16 Nov 341–15 Nov 340
Nectanebo II Year 20	16 Nov 340–15 Nov 339

It is not known when in the Egyptian year 21 Nov 359 BC–20 Nov 358 BC Nectanebo II assumed power. According to Manetho, he reigned 20 years. The highest regnal date in hieroglyphic sources is Year 18.[14]

According to Manetho, or an addition to Manetho, Artaxerxes III, also called Ochos, conquered Egypt in his Year 20.[15] His Babylonian Year 20 ran from spring 339 BC to spring 338 BC. According to predating of postdating (see 1.2 in Chapter III. 11), his Egyptian year 20 would begin on the Egyptian new year of 16 Nov 340 BC.

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[10] K. Ryholt, "A Demotic Version of Nectanebos' Dream (P. Carlsberg 562)", *ZPE* 122 (1998), 197–200, with bibliography. Cf. also A. Spalinger, "The Date of the Dream of Nectanebo", *SAK* 19 (1992), 295–304.

[11] The Demotic version's Year 18 must be an error. Indeed, three other Demotic versions, Carlsberg 424, 499, and 559, date a sequel to the Dream to Year 16 (Ryholt, *ZPE* 122, 198).

[12] Waddell, *Manetho*.

[13] Goldstine's time (*Moons*, 55) for Babylon, minus 53 minutes for Memphis.

[14] Kienitz, *Geschichte*, 216 (part of a useful and extensive listing of documents dating to the fourth century BC).

[15] Waddell, *Manetho*, 184–187.

Remarkably, the conquest is now mostly dated earlier, to 343/2 BC.[16] But on closer inspection, the sole argument ever adduced in favor of 343/2 BC appears non-binding. Persian envoys visited Athens when Lukiskos was archon, from July 344 BC to July 343 BC. It has been assumed that the army of Greek mercenaries hired on the occasion could not have been maintained long without action. The invasion of Egypt must therefore have followed soon, in the fall of 343 BC.[17] This argument is reasonable, but hardly conclusive. It contradicts other evidence that seems firmer. 340/39 BC remains preferable as the date of the re-conquest.

For the rest of Dyns. 28 to 30, Manetho serves as the basis, fine-tuned by data from the monuments. Current assignments of regnal years to Egyptian wandering years are not definitive, but in all probability correct to within one or two years. Africanus, generally considered the best source for Manetho, who is himself not preserved, gives 73 years and 4 months for that period: 6 years for Dyn. 28; 20 years 4 months for Dyn. 29; 38 years for Dyn. 30; and 9 years for Dyn. 31. Provisional dates for the reigns are as follows.[18]

Dyn. 28	
Amyrtaios	about 404/3–398/7
Dyn. 29	
Nepherites I	about 398/7–392/1
Achoris	about 392/1–379/8
Psammuthis	brief reign
Nepherites II	brief reign
Dyn. 30	
Nectanebo I (Nectanebes)	about 379/8–361/0
Teos/Tachos	about 361/0–359/8
Nectanebo II (Nectanebos)	about 359/8–342/1

[16] Kienitz, *Geschichte*, 172; A. B. Lloyd, "Egypt, 404–332 BC", in: *CAH*², vol. 6 (Cambridge, 1994), 337–360, 981–987, at 359, where the date is deemed a 'fact'.

[17] E. J. Bickerman, "Notes sur la chronologie de la XXXᵉ dynastie", in: *Mélanges Maspero* I: *Orient Ancien* (Cairo: MIFAO 56, 1934), 77–84, at 81.

[18] From Lloyd, *CAH*², vol. 6, 358. Lloyd's survey of Egypt in 404–332 BC includes an appendix on chronology. See also J. D. Ray, "Psammuthis and Hakoris", *JEA* 72 (1986), 149–58; C. Traunecker, "Essai sur l'histoire de la XXIXᵉ Dynastie", 79 (1979), 395–436. M. Chauveau ("Les archives d'un temple des oasis au temps des Perses", *BSFE* 137 (1996), 32–47) suggests that Amyrtaios, sole ruler of Dyn. 28, sometimes used the name Psammetichus. That would him make the fifth ruler of that name, in addition to Psammetichus I and II of Dyn. 26 and two postulated ephemeral rulers dating to about 526 BC and to about the mid 480s BC.

The evidence for Dyn. 31 is sparse.[19] The following dates for the lengths of the Egyptian reigns of its three Persian kings are derived from the date of Artaxerxes III's conquest (see section 3 above) and from Ptolemy's Canon (see 2.1 in Chapter III. 11). The first Babylonian regnal years of Arses and Darius III began in the spring of 337 BC and of 335 BC respectively, that is, on the first Babylonian new year following the Canon's beginnings for their reigns, namely 16 Nov 338 BC and 15 Nov 336 BC. Their actual reigns may have begun up to a year earlier and therefore have either preceded or followed the Canon's beginning.

Dyn. 31	ca. 340	–	332
Artaxerxes III (end of reign)	ca. 340	–	338/7
Arses	338/7	–	336/5
Darius III	336/5	–	332

4. *Regnal Years in 690 BC–332 BC*

All the years in the following table are exactly 365 days long. The years printed in italics include a Julian 29 February. The Era of Nabonassar in the first column is a year-count from the first king of Ptolemy's Canon (see 2.1 in Chapter III. 11). The table joins the Canon in 525 BC. Details on the transitions of the historical reigns appear in the notes. The years from 525 BC to the end of the fifth century BC are almost certainly also the actual historical Egyptian regnal years; the years back to 664 BC, with high probability; those back to 690 BC, quite possibly. For the fourth century BC, only regnal years placed with reasonable certainty are listed. To convert, say, Month 5 Day 29 of Year 5 of Cambyses, one may proceed as follows.

[19] See D. Devauchelle, "Réflexions sur les documents égyptiens datés de la Deuxième Domination perse", *Transeuphratène* 10 (1995), 35–43; A. B. Lloyd, "Manetho and the Thirty-first Dynasty", in: *Pyramid Studies and Other Essays Presented to I. E. S. Edwards* (London: EES Occasional Publications 7, 1988), 154–160; A. Spalinger, "The Reign of King Chababash: An Interpretation", *ZÄS* 105 (1978), 142–54. On the *Demotic Chronicle*, see J. H. Johnson, "The Demotic Chronicle as an Historical Source", *Enchoria* 4 (1974), 1–17.

	2 Jan 525	=	Month 1 Day 1	
+ 29				+ 29
	31 Jan 525	=	Month 1 Day 3	
+ 1				+ 1
	1 Feb 525	=	Month 2 Day 1	
+ 28				+ 28
	29 Feb 525	=	Month 2 Day 29	
+ 1				+ 1
			and so on	

Era of Nabonassar	Ruler+ Regnal Year	Length of 365-day Egyptian Year
58	Shabataka? Year ?	
	+ Taharqa 1	12 Feb 690–11 Feb 689[i]
59	Taharqa 2	*12 Feb 689–10 Feb 688*
60	Taharqa 3	11 Feb 688–10 Feb 687
61	Taharqa 4	11 Feb 687–10 Feb 686
62	Taharqa 5	11 Feb 686–10 Feb 685
63	Taharqa 6	*11 Feb 685–9 Feb 684*
64	Taharqa 7	10 Feb 684–9 Feb 683
65	Taharqa 8	10 Feb 683–9 Feb 682
66	Taharqa 9	10 Feb 682–9 Feb 681
67	Taharqa 10	*10 Feb 681–8 Feb 680*
68	Taharqa 11	9 Feb 680–8 Feb 679
69	Taharqa 12	9 Feb 679–8 Feb 678
70	Taharqa 13	9 Feb 678–8 Feb 677
71	Taharqa 14	*9 Feb 677–7 Feb 676*
72	Taharqa 15	8 Feb 676–7 Feb 675
73	Taharqa 16	8 Feb 675–7 Feb 674
74	Taharqa 17	8 Feb 674–7 Feb 673
75	Taharqa 18	*8 Feb 673–6 Feb 672*
76	Taharqa 19	7 Feb 672–6 Feb 671
77	Taharqa 20	7 Feb 671–6 Feb 670
78	Taharqa 21	7 Feb 670–6 Feb 669
79	Taharqa 22	*7 Feb 669–5 Feb 668*
80	Taharqa 23	6 Feb 668–5 Feb 667
81	Taharqa 24	6 Feb 667–5 Feb 666
82	Taharqa 25	6 Feb 666–5 Feb 665
83	Taharqa 26	*6 Feb 665–4 Feb 664*
84	Taharqa 27	5 Feb 664–
	+ Psammetichus I 1	–4 Feb 663[ii]
85	Psammetichus I 2	5 Feb 663–4 Feb 662
86	Psammetichus I 3	5 Feb 662–4 Feb 661
87	Psammetichus I 4	*5 Feb 661–3 Feb 660*

(*continued on next page*)

Table (*cont.*)

Era of Nabonassar	Ruler+ Regnal Year	Length of 365-day Egyptian Year
88	Psammetichus I 5	4 Feb 660–3 Feb 659
89	Psammetichus I 6	4 Feb 659–3 Feb 658
90	Psammetichus I 7	4 Feb 658–3 Feb 657
91	Psammetichus I 8	*4 Feb 657–2 Feb 656*
92	Psammetichus I 9	3 Feb 656–2 Feb 655
93	Psammetichus I 10	3 Feb 655–2 Feb 654
94	Psammetichus I 11	3 Feb 654–2 Feb 653
95	Psammetichus I 12	*3 Feb 653–1 Feb 652*
96	Psammetichus I 13	2 Feb 652–1 Feb 651
97	Psammetichus I 14	2 Feb 651–1 Feb 650
98	Psammetichus I 15	2 Feb 650–1 Feb 649
99	Psammetichus I 16	*2 Feb 649–31 Jan 648*
100	Psammetichus I 17	1 Feb 648–31 Jan 647
101	Psammetichus I 18	1 Feb 647–31 Jan 646
102	Psammetichus I 19	1 Feb 646–31 Jan 645
103	Psammetichus I 20	*1 Feb 645–30 Jan 644*
104	Psammetichus I 21	31 Jan 644–30 Jan 643
105	Psammetichus I 22	31 Jan 643–30 Jan 642
106	Psammetichus I 23	31 Jan 642–30 Jan 641
107	Psammetichus I 24	*31 Jan 641–29 Jan 640*
108	Psammetichus I 25	30 Jan 640–29 Jan 639
109	Psammetichus I 26	30 Jan 639–29 Jan 638
110	Psammetichus I 27	30 Jan 638–29 Jan 637
111	Psammetichus I 28	*30 Jan 637–28 Jan 636*
112	Psammetichus I 29	29 Jan 636–28 Jan 635
113	Psammetichus I 30	29 Jan 635–28 Jan 634
114	Psammetichus I 31	29 Jan 634–28 Jan 633
115	Psammetichus I 32	*29 Jan 633–27 Jan 632*
116	Psammetichus I 33	28 Jan 632–27 Jan 631
117	Psammetichus I 34	28 Jan 631–27 Jan 630
118	Psammetichus I 35	28 Jan 630–27 Jan 629
119	Psammetichus I 36	*28 Jan 629–26 Jan 628*
120	Psammetichus I 37	27 Jan 628–26 Jan 627
121	Psammetichus I 38	27 Jan 627–26 Jan 626
122	Psammetichus I 39	27 Jan 626–26 Jan 625
123	Psammetichus I 40	*27 Jan 625–25 Jan 624*
124	Psammetichus I 41	26 Jan 624–25 Jan 623
125	Psammetichus I 42	26 Jan 623–25 Jan 622
126	Psammetichus I 43	26 Jan 622–25 Jan 621
127	Psammetichus I 44	*26 Jan 621–24 Jan 620*
128	Psammetichus I 45	25 Jan 620–24 Jan 619
129	Psammetichus I 46	25 Jan 619–24 Jan 618

(*continued on next page*)

Table (*cont.*)

Era of Nabonassar	Ruler+ Regnal Year	Length of 365-day Egyptian Year
130	Psammetichus I 47	25 Jan 618–24 Jan 617
131	Psammetichus I 48	*25 Jan 617–23 Jan 616*
132	Psammetichus I 49	24 Jan 616–23 Jan 615
133	Psammetichus I 50	24 Jan 615–23 Jan 614
134	Psammetichus I 51	24 Jan 614–23 Jan 613
135	Psammetichus I 52	*24 Jan 613–22 Jan 612*
136	Psammetichus I 53	23 Jan 612–22 Jan 611
137	Psammetichus I 54	23 Jan 611–22 Jan 610
138	Psammetichus I 55	23 Jan 610– –no later than 18 Nov 610[iii]
	+ Necho II 1	by 19 Nov 610 at the latest[iii]– –22 Jan 609
139	Necho II 2	*23 Jan 609–21 Jan 608*
140	Necho II 3	22 Jan 608–21 Jan 607
141	Necho II 4	22 Jan 607–21 Jan 606
142	Necho II 5	22 Jan 606–21 Jan 605
143	Necho II 6	*22 Jan 605–20 Jan 604*
144	Necho II 7	21 Jan 604–20 Jan 603
145	Necho II 8	21 Jan 603–20 Jan 602
146	Necho II 9	21 Jan 602–20 Jan 601
147	Necho II 10	*21 Jan 601–19 Jan 600*
148	Necho II 11	20 Jan 600–19 Jan 599
149	Necho II 12	20 Jan 599–19 Jan 598
150	Necho II 13	20 Jan 598–19 Jan 597
151	Necho II 14	*20 Jan 597–18 Jan 596*
152	Necho II 15	19 Jan 596–18 Jan 595
153	Necho II 16	19 Jan 595– –at least until 4 May 595[iv]
	+ Psammetichus II 1	by 23 Nov 595 at the latest– –18 Jan 594[iv]
154	Psammetichus II 2	19 Jan 594–18 Jan 593
155	Psammetichus II 3	*19 Jan 593–17 Jan 592*
156	Psammetichus II 4	18 Jan 592–17 Jan 591
157	Psammetichus II 5	18 Jan 591–17 Jan 590
158	Psammetichus II 6	18 Jan 590–17 Jan 589
159	Psammetichus II 7	*18 Jan 589–9 Feb 589*
	+ Apries 1	10 Feb 589–16 Jan 588[v]
160	Apries 2	17 Jan 588–16 Jan 587
161	Apries 3	17 Jan 587–16 Jan 586
162	Apries 4	17 Jan 586–16 Jan 585
163	Apries 5	*17 Jan 585–15 Jan 584*
164	Apries 6	16 Jan 584–15 Jan 583

(*continued on next page*)

Table (*cont.*)

Era of Nabonassar	Ruler+ Regnal Year	Length of 365-day Egyptian Year
165	Apries 7	16 Jan 583–15 Jan 582
166	Apries 8	16 Jan 582–15 Jan 581
167	Apries 9	*16 Jan 581–14 Jan 580*
168	Apries 10	15 Jan 580–14 Jan 579
169	Apries 11	15 Jan 579–14 Jan 578
170	Apries 12	15 Jan 578–14 Jan 577
171	Apries 13	*15 Jan 577–13 Jan 576*
172	Apries 14	14 Jan 576–13 Jan 575
173	Apries 15	14 Jan 575–13 Jan 574
174	Apries 16	14 Jan 574–13 Jan 573
175	Apries 17	*14 Jan 573–12 Jan 572*
176	Apries 18	13 Jan 572–12 Jan 571
177	Apries 19	13 Jan 571–12 Jan 570
178	Apries 20	13 Jan 570– –at least until 19 Oct 570[vi]
	+ Amasis 1	by Day x in 11 Jul–9 Aug 570 at the latest[vi]–12 Jan 569
179	Amasis 2	*13 Jan 569–11 Jan 568*
180	Amasis 3	12 Jan 568–11 Jan 567
181	Amasis 4	12 Jan 567–11 Jan 566
182	Amasis 5	12 Jan 566–11 Jan 565
183	Amasis 6	*12 Jan 565–10 Jan 564*
184	Amasis 7	11 Jan 564–10 Jan 563
185	Amasis 8	11 Jan 563–10 Jan 562
186	Amasis 9	11 Jan 562–10 Jan 561
187	Amasis 10	*11 Jan 561–9 Jan 560*
188	Amasis 11	10 Jan 560–9 Jan 559
189	Amasis 12	10 Jan 559–9 Jan 558
190	Amasis 13	10 Jan 558–9 Jan 557
191	Amasis 14	*10 Jan 557–8 Jan 556*
192	Amasis 15	9 Jan 556–8 Jan 555
193	Amasis 16	9 Jan 555–8 Jan 554
194	Amasis 17	9 Jan 554–8 Jan 553
195	Amasis 18	*9 Jan 553–7 Jan 552*
196	Amasis 19	8 Jan 552–7 Jan 551
197	Amasis 20	8 Jan 551–7 Jan 550
198	Amasis 21	8 Jan 550–7 Jan 549
199	Amasis 22	*8 Jan 549–6 Jan 548*
200	Amasis 23	7 Jan 548–6 Jan 547
201	Amasis 24	7 Jan 547–6 Jan 546
202	Amasis 25	7 Jan 546–6 Jan 545
203	Amasis 26	*7 Jan 545–5 Jan 544*

(*continued on next page*)

Table (*cont.*)

Era of Nabonassar	Ruler+ Regnal Year	Length of 365-day Egyptian Year
204	Amasis 27	6 Jan 544–5 Jan 543
205	Amasis 28	6 Jan 543–5 Jan 542
206	Amasis 29	6 Jan 542–5 Jan 541
207	Amasis 30	*6 Jan 541–4 Jan 540*
208	Amasis 31	5 Jan 540–4 Jan 539
209	Amasis 32	5 Jan 539–4 Jan 538
210	Amasis 33	5 Jan 538–4 Jan 537
211	Amasis 34	*5 Jan 537–3 Jan 536*
212	Amasis 35	4 Jan 536–3 Jan 535
213	Amasis 36	4 Jan 535–3 Jan 534
214	Amasis 37	4 Jan 534–3 Jan 533
215	Amasis 38	*4 Jan 533–2 Jan 532*
216	Amasis 39	3 Jan 532–2 Jan 531
217	Amasis 40	3 Jan 531–2 Jan 530
218	Amasis 41	3 Jan 530–2 Jan 529
219	Amasis 42	*3 Jan 529–1 Jan 528*
220	Amasis 43	2 Jan 528–1 Jan 527
221	Amasis 44	2 Jan 527–
	+ uncertain[vii]	–1 Jan 526
222	uncertain[vii]	2 Jan 526–1 Jan 525
223[viii]	uncertain[vii]	*2 Jan 525–*
	+ Cambyses 5	*–31 Dec 525*
224	Cambyses 6	1 Jan 524–31 Dec 524
225	Cambyses 7	1 Jan 523–31 Dec 523
226[ix]	Cambyses 8	1 Jan 522–death in 522[x]
	+ Darius I's accession year	accession in 522[xi]– –31 Dec 522
227[ix]	Darius I's accession year or Year 1?	*1 Jan 521–* –ca. *13 Apr 521*[xii]
	Darius I 1	*ca.* 13 Apr 521– –30 Dec 521
228	Darius I 2	31 Dec 521–30 Dec 520
229	Darius I 3	31 Dec 520–30 Dec 519
230	Darius I 4	31 Dec 519–30 Dec 518
231	Darius I 5	*31 Dec 518–29 Dec 517*
232	Darius I 6	30 Dec 517–29 Dec 516
233	Darius I 7	30 Dec 516–29 Dec 515
234	Darius I 8	30 Dec 515–29 Dec 514
235	Darius I 9	*30 Dec 514–28 Dec 513*
236	Darius I 10	29 Dec 513–28 Dec 512
237	Darius I 11	29 Dec 512–28 Dec 511
238	Darius I 12	29 Dec 511–28 Dec 510

(*continued on next page*)

Table (*cont.*)

Era of Nabonassar	Ruler+ Regnal Year	Length of 365-day Egyptian Year
239	Darius I 13	*29 Dec 510–27 Dec 509*
240	Darius I 14	28 Dec 509–27 Dec 508
241	Darius I 15	28 Dec 508–27 Dec 507
242	Darius I 16	28 Dec 507–27 Dec 506
243	Darius I 17	*28 Dec 506–26 Dec 505*
244	Darius I 18	27 Dec 505–26 Dec 504
245	Darius I 19	27 Dec 504–26 Dec 503
246	Darius I 20	27 Dec 503–26 Dec 502
247	Darius I 21	*27 Dec 502–25 Dec 501*
248	Darius I 22	26 Dec 501–25 Dec 500
249	Darius I 23	26 Dec 500–25 Dec 499
250	Darius I 24	26 Dec 499–25 Dec 498
251	Darius I 25	*26 Dec 498–24 Dec 497*
252	Darius I 26	25 Dec 497–24 Dec 496
253	Darius I 27	25 Dec 496–24 Dec 495
254	Darius I 28	25 Dec 495–24 Dec 494
255	Darius I 29	*25 Dec 494–23 Dec 493*
256	Darius I 30	24 Dec 493–23 Dec 492
257	Darius I 31	24 Dec 492–23 Dec 491
258	Darius I 32	24 Dec 491–23 Dec 490
259	Darius I 33	*24 Dec 490–22 Dec 489*
260	Darius I 34	23 Dec 489–22 Dec 488
261	Darius I 35	23 Dec 488–22 Dec 487
262[xiii]	Darius I 36	23 Dec 487– –at least until 24 Nov 486[xiv]
	+ Xerxes I's accession year	at the latest by 1 Dec 486– –22 Dec 486
263[xiii]	Xerxes I's accession year or Year 1?	*23 Dec 486–* –ca. *5 Apr 485*[xv]
	Xerxes I 1	ca. 5 Apr 485[xv]–21 Dec 485
264	Xerxes I 2	22 Dec 485–21 Dec 484
265	Xerxes I 3	22 Dec 484–21 Dec 483
266	Xerxes I 4	22 Dec 483–21 Dec 482
267	Xerxes I 5	*22 Dec 482–20 Dec 481*
268	Xerxes I 6	21 Dec 481–20 Dec 480
269	Xerxes I 7	21 Dec 480–20 Dec 479
270	Xerxes I 8	21 Dec 479–20 Dec 478
271	Xerxes I 9	*21 Dec 478–19 Dec 477*
272	Xerxes I 10	20 Dec 477–19 Dec 476
273	Xerxes I 11	20 Dec 476–19 Dec 475
274	Xerxes I 12	20 Dec 475–19 Dec 474
275	Xerxes I 13	*20 Dec 474–18 Dec 473*

(*continued on next page*)

Table (*cont.*)

Era of Nabonassar	Ruler+ Regnal Year	Length of 365-day Egyptian Year
276	Xerxes I 14	19 Dec 473–18 Dec 472
277	Xerxes I 15	19 Dec 472–18 Dec 471
278	Xerxes I 16	19 Dec 471–18 Dec 470
279	Xerxes I 17	*19 Dec 470–17 Dec 469*
280	Xerxes I 18	18 Dec 469–17 Dec 468
281	Xerxes I 19	18 Dec 468–17 Dec 467
282	Xerxes I 20	18 Dec 467–17 Dec 466
283[xvi]	Xerxes I 21	*18 Dec 466– –Day x in 4–8 Aug 465*[xvii]
	+ Artaxerxes I's accession year?	by 5 Aug 465 at the earliest[xviii]– –16 Dec 465
284[xvi]	Artaxerxes I's accession year or Year 1?	17 Dec 465– –ca. 13 Apr 464[xix]
	Artaxerxes I 1	ca. 13 Apr 464–16 Dec 464
285	Artaxerxes I 2	17 Dec 464–16 Dec 463
286	Artaxerxes I 3	17 Dec 463–16 Dec 462
287	Artaxerxes I 4	*17 Dec 462–15 Dec 461*
288	Artaxerxes I 5	16 Dec 461–15 Dec 460
289	Artaxerxes I 6	16 Dec 460–15 Dec 459
290	Artaxerxes I 7	16 Dec 459–15 Dec 458
291	Artaxerxes I 8	*16 Dec 458–14 Dec 457*
292	Artaxerxes I 9	15 Dec 457–14 Dec 456
293	Artaxerxes I 10	15 Dec 456–14 Dec 455
294	Artaxerxes I 11	15 Dec 455–14 Dec 454
295	Artaxerxes I 12	*15 Dec 454–13 Dec 453*
296	Artaxerxes I 13	14 Dec 453–13 Dec 452
297	Artaxerxes I 14	14 Dec 452–13 Dec 451
298	Artaxerxes I 15	14 Dec 451–13 Dec 450
299	Artaxerxes I 16	*14 Dec 450–12 Dec 449*
300	Artaxerxes I 17	13 Dec 449–12 Dec 448
301	Artaxerxes I 18	13 Dec 448–12 Dec 447
302	Artaxerxes I 19	13 Dec 447–12 Dec 446
303	Artaxerxes I 20	*13 Dec 446–11 Dec 445*
304	Artaxerxes I 21	12 Dec 445–11 Dec 444
305	Artaxerxes I 22	12 Dec 444–11 Dec 443
306	Artaxerxes I 23	12 Dec 443–11 Dec 442
307	Artaxerxes I 24	*12 Dec 442–10 Dec 441*
308	Artaxerxes I 25	11 Dec 441–10 Dec 440
309	Artaxerxes I 26	11 Dec 440–10 Dec 439
310	Artaxerxes I 27	11 Dec 439–10 Dec 438
311	Artaxerxes I 28	*11 Dec 438–9 Dec 437*
312	Artaxerxes I 29	10 Dec 437–9 Dec 436

(*continued on next page*)

Table (*cont.*)

Era of Nabonassar	Ruler+ Regnal Year	Length of 365-day Egyptian Year
313	Artaxerxes I 30	10 Dec 436–9 Dec 435
314	Artaxerxes I 31	10 Dec 435–9 Dec 434
315	Artaxerxes I 32	*10 Dec 434–8 Dec 433*
316	Artaxerxes I 33	9 Dec 433–8 Dec 432
317	Artaxerxes I 34	9 Dec 432–8 Dec 431
318	Artaxerxes I 35	9 Dec 431–8 Dec 430
319	Artaxerxes I 36	*9 Dec 430–7 Dec 429*
320	Artaxerxes I 37	8 Dec 429–7 Dec 428
321	Artaxerxes I 38	8 Dec 428–7 Dec 427
322	Artaxerxes I 39	8 Dec 427–7 Dec 426
323	Artaxerxes I 40	*8 Dec 426–6 Dec 425*
324[xx]	Artaxerxes I 41[xxi]	7 Dec 425– –death (Feb 424?)
	ephemeral rulers[xxi]	death Artaxerxes I– –6 Dec 424
325[xx]	ephemeral rulers[xxi]	7 Dec 424–Darius II's accession on Day x in 25 Dec 424–13 Feb 423
	Darius II's accession year[xxi]	Darius II's accession –ca. 11 Apr 423
	Darius II 1[xxi]	ca. 11 Apr 423–6 Dec 423
326	Darius II 2	7 Dec 423–6 Dec 422
327	Darius II 3	*7 Dec 422–5 Dec 421*
328	Darius II 4	6 Dec 421–5 Dec 420
329	Darius II 5	6 Dec 420–5 Dec 419
330	Darius II 6	6 Dec 419–5 Dec 418
331	Darius II 7	*6 Dec 418–4 Dec 417*
332	Darius II 8	5 Dec 417–4 Dec 416
333	Darius II 9	5 Dec 416–4 Dec 415
334	Darius II 10	5 Dec 415–4 Dec 414
335	Darius II 11	*5 Dec 414–3 Dec 413*
336	Darius II 12	4 Dec 413–3 Dec 412
337	Darius II 13	4 Dec 412–3 Dec 411
338	Darius II 14	4 Dec 411–3 Dec 410
339	Darius II 15	*4 Dec 410–2 Dec 409*
340	Darius II 16	3 Dec 409–2 Dec 408
341	Darius II 17	3 Dec 408–2 Dec 407
342	Darius II 18	3 Dec 407–2 Dec 406
343[xxii]	Darius II 19	*3 Dec 406–* *–at least until ca. 17 Sep 405*[xxiii]
	Darius II 19 and Artaxerxes II's accession year?	ca. 18 Sep 405– –1 Dec 405[xxiii]

(*continued on next page*)

Table (*cont.*)

Era of Nabonassar	Ruler+ Regnal Year	Length of 365-day Egyptian Year
344[xxii]	Darius II 19 or Artaxerxes II's accession year?	2 Dec 405– –ca. 10 Apr 404[xxiii]
	Artaxerxes II 1	ca. 10 Apr 404– –1 Dec 404[xxiii]
345	Artaxerxes II 2	2 Dec 404–1 Dec 403
346	Artaxerxes II 3	2 Dec 403–1 Dec 402
347	Artaxerxes II 4	*2 Dec 402–30 Nov 401*
348	Artaxerxes II 5	1 Dec 401–30 Nov 400

About this time, Persia lost control of Egypt.[xxiv] The native kings of Dyns. 28–30 ruled for about seven decades. Their reigns are not day-exact, except Nectanebo II's of Dyn. 30. The following provisional estimates (see Lloyd, *CAH*², vol. 6, 358) are probably correct to within one or two years.[xxv]

Dynasty 28	
Amyrtaios	ca. 404/3–398/7
Dynasty 29	
Nepherites I	ca. 398/7–392/1
Achoris	ca. 392/1–379/8
Psammuthis	brief reign
Nepherites II	brief reign
Dynasty 30	
Nectanebo I (Nectanebes)	ca. 379/8–361/0
Teos/Tachos	ca. 361/0–359/8

The reign of the third king of Dyn. 30 and the last native ruler of Egypt, Nectanebo II (Nectanebos), is again day-exact, with high probability, as follows.

390	Nectanebo II 1	21 Nov 359–20 Nov 358[xxvi]
391	Nectanebo II 2	*21 Nov 358–19 Nov 357*
392	Nectanebo II 3	20 Nov 357–19 Nov 356
393	Nectanebo II 4	20 Nov 356–19 Nov 355
394	Nectanebo II 5	20 Nov 355–19 Nov 354
395	Nectanebo II 6	*20 Nov 354–18 Nov 353*
396	Nectanebo II 7	19 Nov 353–18 Nov 352
397	Nectanebo II 8	19 Nov 352–18 Nov 351
398	Nectanebo II 9	19 Nov 351–18 Nov 350
399	Nectanebo II 10	*19 Nov 350–17 Nov 349*
400	Nectanebo II 11	18 Nov 349–17 Nov 348
401	Nectanebo II 12	18 Nov 348–17 Nov 347
402	Nectanebo II 13	18 Nov 347–17 Nov 346
403	Nectanebo II 14	*18 Nov 346–16 Nov 345*

(*continued on next page*)

Table (*cont.*)

Era of Nabonassar	Ruler+ Regnal Year	Length of 365-day Egyptian Year
404	Nectanebo II 15	17 Nov 345–16 Nov 344
405	Nectanebo II 16	17 Nov 344–16 Nov 343
406	Nectanebo II 17	17 Nov 343–16 Nov 342
407	Nectanebo II 18	*17 Nov 342–15 Nov 341*
408	Nectanebo II 19	16 Nov 341–15 Nov 340[xxvii]
409	Nectanebo II 20	16 Nov 340–15 Nov 339[xxvii]

The following years are Egyptian years derived from the Canon (see section 3 above).

409	Artaxerxes III 20	16 Nov 340–15 Nov 339
410	Artaxerxes III 21	16 Nov 339–15 Nov 338
411	Arses 1	*16 Nov 338–14 Nov 337*
412	Arses 2	15 Nov 337–14 Nov 336
413	Darius III 1	15 Nov 336–14 Nov 335
414	Darius III 2	15 Nov 335–14 Nov 334
415	Darius III 3	*15 Nov 334–13 Nov 333*
416	Darius III 4	14 Nov 333–13 Nov 332
417	Alexander 1	14 Nov 332–13 Nov 331
	and so on	and so on

[i] Taharqa presumably came to the throne some day in this Egyptian year. There is a possibility that Year 1 is 12 Feb 691–11 Feb 690 (see section 2 above). No documents dating to Taharqa's Years 1 and 2 are known (cf. Chapter III. 11, section 3).

[ii] Psammetichus I's reign presumably began in this Egyptian year. No documents dating to his Years 1–8 are known.

[iii] The earliest date for Necho II is 19 Nov 610 BC, or Year 1 Month 11 Day 1, in stela Leyden V 18–9 (Kienitz, *Geschichte*, 155, with note 6, and 157–158).

[iv] The latest date for Necho II is 4 May 595 BC, or Year 16 Month 4 Day 16, in stela Louvre 193 (Kienitz, *Geschichte*, 155, with note 2, and 158). The earliest date for Psammetichus II is 23 Nov 594 BC, or Year 1 Month 11 Day 9, in stela Louvre 240 (Kienitz, *Geschichte*, 155, with note 4, and 158).

[v] Psammetichus II died on 9 Feb 589 BC, or Year 7 Month 1 Day 23. The next day is here taken as Day 1 of Apries's reign.

[vi] The latest date for Apries is 19 Oct 570 BC, or Year 20 Month 10 Day 10, in abnormal hieratic pBM 10113 (M. Malinine, *Choix de textes juridiques*, I (Paris, 1953), 17). The same document even anticipates a regnal Year 21 for Apries. The earliest date for Amasis is 11 Jul–9 Aug 570 BC, or Year 1 Month 7, in a stela from the northwest Delta (Kienitz, *Geschichte*, 158, with note 4; G. Maspero, "Sur deux stèles récemment découvertes", *RecTrav* 15 (1893), 84–86, at 86; E. Edel, "Amasis und Nebukadnezar II", *GM* 29 (1978), 13–20, at 13).

It has hitherto remained without explicit notice, as far as I know, that the latest date for Apries is later than the earliest date for Amasis, although S. P. Vleeming ("The Sale of a Slave in the Time of Pharaoh *Py*", *OMRO* 61 (1980), 1–17, at 6, note 20) rightly calls the Apries date "rather high." It now becomes possible to buttress the

veracity of Herodotus's account (II, 169) about the overlap of the reigns of Apries and Amasis. After a short period with two rival Pharaohs, Amasis first vanquished Apries but then let him rule as coregent before eventually killing him. It is not clear whether Apries was a rival ruler or a nominal coregent on 19 Oct 570 BC, the date of pBM 10113. It is significant that pBM 10113 is, like all abnormal hieratic texts, from Thebes, which was Apries's power base as rival ruler, whereas the Amasis stela mentioned above is from the Delta, Amasis's original power base.

[vii] For the chronology of the transition from Amasis to Cambyses, see section 2 above. Amasis could still have been in power on 1 Jan 526 BC as last day of his Year 44. Greek sources mention a king Psammetichus, commonly styled as "III," who ruled six months between Amasis and Cambyses. The sole native documents ever assigned to his reign have recently been re-dated to a Psammetichus "IV," who may have ruled part of Egypt in the 480s BC (see E. Cruz-Uribe, "On the Existence of Psammetichus IV," Serapis 5 (1980), 35–39; cf. also P. W. Pestman, "The Diospolis Parva Documents: Chronological Problems concerning Psammetichus III and IV", in: *Grammata Demotika*, H.-J. Thissen & K.-Th. Zauzich, eds., (Würzburg, 1984), 145–155; S. P. Vleeming, *The Gooseherds of Hou (Pap. Hou)* (Leuven: Studia demotica 3, 1991), 3–4).

[viii] With this Egyptian year, Year 223 from Nabonassar, the present table joins Ptolemy's Canon, which earlier lists rulers of Babylon (see Chapter III. 11, section 2.1). In the Canon, whose years are all full 365-day Egyptian years, Year 223 from Nabonassar is entirely Year 5 of Cambyses.

[ix] In Ptolemy's Canon, Year 226 from Nabonassar is entirely Year 8 of Cambyses and Year 227 entirely Year 1 of Darius I.

[x] Cambyses was still recognized in Babylon in April 522 BC and, according to the Behistun inscription, did not die till after 1 Jul 522 BC (Parker & Dubberstein, *Chronology*, 14).

[xi] The accession to the throne probably occurred between about 29 Sep 522 BC, the date of Bardiya's defeat according to the Behistun inscription, and about 22 Dec 522 BC, the date of the earliest Babylonian tablet of Darius I's reign (Parker & Dubberstein, *Chronology*, 15). Again, lunar dates are mostly not known to the exact Julian day but cannot be more than one to two days off.

[xii] It is not known whether the time from the Egyptian new year of 1 Jan 521 BC to the Babylonian new year of about 13 Apr 521 BC was called Year 1 in Egypt or considered part of a numberless accession year (for an argument in support of the latter, see L. Depuydt, "Regnal Years and Civil Calendar in Achaemenid Egypt;" *JEA* 81 (1995), 151–173, at 164). In Babylon, for sure, regnal Year 1 did not begin before the first Babylonian new year of the reign.

[xiii] In Ptolemy' Canon, Year 262 from Nabonassar is entirely Year 36 of Darius I and Year 263 entirely year 1 of Xerxes I.

[xiv] The latest date for Darius I is about 24 Nov 486 BC (Parker & Dubberstein, *Chronology*, 17). The earliest known date for Xerxes I is about 1 Dec 486 BC (M.W. Stolper, "Babylonian Evidence for the End of the Reign of Darius I: A Correction", *JNES* 51 (1992), 61–62; cf. Depuydt, *JEA* 81, 157, note 22).

[xv] It is not clear whether, in Egypt, the time from the Egyptian new year of 23 Dec 486 BC, to the Babylonian new year of about 5 Apr 485 BC was called Year 1 or considered part of as numberless accession year. Cf. note xii above.

[xvi] In Ptolemy's Canon, Year 283 from Nabonassar is entirely Year 21 of Xerxes and Year 284 entirely Year 1 of Artaxerxes I.

[xvii] Xerxes I may have been murdered on one of these days. The source is an eclipse text (Parker & Dubberstein, *Chronology*, 17).

[xviii] This is the first day after the earliest possible date for the murder of Xerxes I (see note xvii). The earliest date for Artaxerxes I is 2 Jan 464 BC in an Aramaic papyrus ("B2.2" in B. Porten and A. Yardeni, *Textbook of Aramaic Documents from Ancient Egypt* (Jerusalem, 1986–99). Since the date is from Aswan, Artaxerxes I was probably

in power already in 465 BC and perhaps even before the Egyptian new year of 16 Dec 465 BC. His Babylonian regnal Year 1 certainly began about 13 Apr 464 BC. His Egyptian year may have begun earlier, but hardly before the Egyptian new year of 17 Dec 465 BC (cf. notes xii and xix).

[xix] It is not known whether the period from the Egyptian new year of 17 Dec 465 BC to the Babylonian new year of about 13 Apr 464 BC was called Year 1 in Egypt or considered part of a numberless accession year (cf. notes xii and xviii).

[xx] In Ptolemy's Canon, Year 324 from Nabonassar is entirely Year 41 of Artaxerxes I and Year 325 entirely Year 1 of Darius II.

[xxi] For problems pertaining to the chronology of the transition from Artaxerxes I to Darius II, see L. Depuydt, "The Date of Death of Artaxerxes I", *WdO* 26 (1995), 86–96; id., JEA 81, 159, note 28. Arguments can be produced for the following possible scenario: (1) Artaxerxes I dies in Feb 424 BC; (2) ephemeral kings including Xerxes II and Sogdianus rule for several months, while documents keep being dated according to Artaxerxes I, whose fictional Babylonian Year 41 began about 24 Apr 424 BC; (3) Darius II assumes power some day in 25 Dec 424 BC–13 Feb 423 BC, perhaps rather near the end of this period. Darius II's Year 1 had certainly begun by about 10 April 404 BC, the Babylonian new year.

[xxii] In Ptolemy's Canon, Year 343 from Nabonassar is entirely Year 19 of Darius II and Year 344 entirely Year 1 of Artaxerxes II.

[xxiii] It is certain that Artaxerxes II's Babylonian regnal Year 1 began on about 10 April 404 BC, the Babylonian new year. The latest date for Darius II is about 17 Sep 405 BC, the date of Louvre cuneiform tablet AO 17603 (cf. Depuydt, *JEA* 81, 159, n. 29). It is not known when in the period from about 17 Sep 405 BC to about 10 Apr 404 BC the transition from Darius II to Artaxerxes II happened.

[xxiv] The latest date is 18 Jan 401 BC (see Chapter III. 11, section 3).

[xxv] Ptolemy's Canon continues at this point with regnal Years 6–46 of Artaxerxes II, measured by the Egyptian calendar. The New Year's days of these 41 full Egyptian civil years, Years 349 to 389 from Nabonassar, are as follows: 1 Dec 400–398 BC in years 349–51 from Nabonassar (= Artaxerxes II's regnal Years 6–8); 30 Nov 397–4 BC in 352–5 Nab. (= 9–12); 29 Nov 393–0 BC in 356–9 Nab. (= 13–6); 28 Nov 389–6 BC in 360–3 Nab. (= 17–20); 27 Nov 385–2 BC in 364–7 Nab. (21–4); 26 Nov 381–78 BC in 368–71 Nab. (= 25–28); 25 Nov 377–4 BC in 372–5 Nab. (= 29–32); 24 Nov 373–0 BC in 376–9 Nab. (= 33–6); 23 Nov 369–6 BC in 380–3 Nab. (= 37–40); 22 Nov 365–2 BC in 384–7 Nab. (= 41–4); 21 Nov 361–0 BC in 388–9 Nab. (= 45–6).

[xxvi] It is not known when Nectanebo II assumed power in this Egyptian year.

[xxvii] There is no hieroglyphic evidence for Years 19 and 20 of Nectanebo II.

II. 12 THE CHRONOLOGY OF NUBIAN KINGDOMS FROM DYN. 25 TO THE END OF THE KINGDOM OF MEROE

Karola Zibelius-Chen

The era of the independent kingdom of Kush in Nubia is broadly divided into four parts:

1. Pre-Dyn. 25, i.e. the epoch of the preliterate rulers of el-Kurru with approximately 6 reigns up to and including Alara, known from their tombs in the necropolis of el-Kurru (ca. 885/835 BC[1] to ca. 765 BC).[2]
2. Dyn. 25, simultaneously a segment of Egyptian history—and differing from Manetho and Egyptological tradition—plus the Kushite Kashta (Gen. 1) as its first king, since he secured the Thebaid by having his daughter Amenirdis I adopted by the Egyptian God's Wife Shepenupet I, daughter of Osorkon III.[3] Thus his daughter succeeded Shepenupet in her official role at Thebes. The Assyrians effectively ended the dynasty, and Psammetichus I expelled the last Kushites at the time of Tanwetamani (ca. 655 BC).
3. The Napatan Period, subdivided into an Early Napatan Period (Atlanersa (Gen. 7) to Malowi-Amani (Gen. 19),[4] ca. 653 until the mid-5th century BC) and the Late Napatan period, from Talakhamani and including the so-called Neo-Ramesside rulers with 5 kings up to Sabrakamani[5] (mid 5th century to early 3rd century BC).

[1] See T. Kendall, *Meroitica* 15 (1999), 97. A long chronology (most recently L. Török, Meroitica 14 (1999), 149ff.) no longer seems tenable after Kendall's article.

[2] Conventional dates reckoned back from the Tang-i Var inscription (see below) with the accession of Shebitku in 707: Shabaka, 15 years (highest known date: statue of *Jty*, BM 24429: Leclant, *Enquêtes*, 15ff.); Piankhi, 31 years inferred; Kashta (= Manetho's Ammeris Aithiops), 12 years assumed; Alara, 20 years presumed; plus roughly 50 to 100 years for the five reigns between Alara and the foundation of the el-Kurru necropolis. (For the reinstatement of the reading Piankhi, see C. Rilly, *BIFAO* 101 (2001), 351ff.)

[3] So R. G. Morkot, *Meroitica* 15 (1999), 195f., contra Kitchen, *TIP*[3], § 122, who assumes that Amenirdis I was installed by her brother Piankhi.

[4] I prefer this transcription to Malowiebamani (Macadam, Kawa I, 54 (25), with  reproducing Meroitic -b indicating a plural). I suppose instead that  is a phonetic determinative, derived from Egyptian *wꜣj* (*Wb* I, 246).

[5] Contrast Hofmann, *Chronologie*, 64ff.

4. The Meroitic Period with the Early Meroitic period from Arkamaniqo/Ergamenes I (Gen. 33) up to Queen Sanakadakhete (ca. early 3rd century until late 2nd century BC), the Middle Meroitic period (late 2nd century BC to late 1st or early 2nd century AD), followed by the Late Meroitic Period (late 1st or early 2nd century AD until the end of the Meroitic kingdom).[6]

In the southern part of the kingdom, the post-Meroitic Period follows[7] with off-shoots of Meroitic culture surviving the end of the Kingdom between 330 and 370 AD (when the royal necropolis at Begerawiya North and the West cemetery at Begerawiya were finally abandoned)[8] and the Ballana culture (so-called X-Group) in Lower Nubia with royal necropoleis at Qustul and Ballana which are beyond the chronological range concerning us here.

This historical division into four periods ultimately depends on linking the seriation of the tombs in the royal necropoleis of the kingdom to other monuments and epigraphic data. Individual rulers are numbered according to their relative positions in a scheme of generations (Gen.), especially since existing royal tombs cannot be assigned in every case to specific named rulers, and since some known rulers cannot yet be associated with any tomb. The cemeteries are el-Kurru (Ku.), Nuri (Nu.), Gebel Barkal (Bar.), Begerawiya South (Beg. S., with only two kings' tombs but other royal and non-royal burials), Begerawiya North (Beg. N.) and Begerawiya West (Beg. W., used by lesser members of the royal family and commoners). The excavator Reisner[9] established a typology, based on the architectural evolution of the tombs, and he identified tomb groups.[10] Reisner's archaeological seriation of the tombs,

[6] Török, *Meroe City—An ancient African capital: John Garstang's excavations in the Sudan* (London, 1997), 13–14.

[7] As viewed from a political perspective; see Török, in: Welsby, *Research*, 142ff. Whether the cultural aspect of the transitional phase should be described as "post-pyramidal" (P. Lenoble, *SARS Newsletter* 3 (1992), 9ff.; idem, *MNL* 25 (1994), 113f.; idem, in: Welsby, *Research*, 157ff.), remains open.

[8] The end of the Meroitic state and the abandonment of the royal cemetery in Beg. N. ca. 360/370 AD was approximately contemporaneous with the military campaign of the Axumite king Ezana against the Noba, unless Ezana's conversion to Christianity was earlier, around 330 AD. If so, the demise of Meroe will have been prolonged, from 330 to 360/70 AD. See Török's summary of the issues, in: Welsby, *Research*, 142ff.

[9] G. A. Reisner, "Preliminary Report on the Harvard-Boston excavations at Nûri: the kings of Ethiopia after Tirhaqa", *HAS* II (1918), 1–64; idem, *SNR* 2 (1919), 35–67, 237–253; idem, *JEA* 9 (1923), 34–77, 157–160.

[10] Török summarizes Reisner's criteria in: *ANRW* II 10, 169ff.

which envisoned a continuous succession of 5 plus 68 rulers, 850 BC to 355 AD,[11] was revised by Dunham when he published the excavations.[12] Further revisions[13] were undertaken by Macadam[14] and, for the Meroitic material in particular, by Hintze[15] and Wenig.[16] The last also drew on the iconography of the tomb chapel reliefs which provides information about the tomb-owner (king, queen, prince), resulting in the elimination of some pyramid owners from the list of reigning monarchs, but also on additional criteria for sequencing and thus dating tombs. Wenig's research eliminated Reisner's First Collateral Meroitic Dynasty of Napata, and integrated its rulers into the main line. The problem of the Second Collateral Dynasty of Napata, however, cannot be considered resolved. To include it, too, in the main line as Wenig proposes, seems justified, by demonstrable kinship relationships between pyramid owners in Barkal and Begerawiya North, aside from the fact that most of the rulers of the 1st century BC (to which the tombs belong) are attested both in the north and in Meroe. But if so, temporary changes in the royal burial grounds must be assumed, which could perhaps be explained in the context of the contemporaneous political situation.[17]

While Napatan internal chronology can generally be considered reliable,[18] despite some specific problems and questions,[19] the same cannot

[11] The seriation, attempted by K. Grzymski, *Meroitica* 7 (1984), 222ff., using computer-aided quantitative analysis is generally considered unsuccessful.

[12] RCK I, II, IV, V. RCK IV, 6f.: 5 plus 72 rulers.

[13] On the typology for the last 20 generations, see F. Hinkel, *ZÄS* 108 (1981), 105ff.; idem, *ZÄS* 109 (1982), 27ff.; 127ff.; idem, *Bulletin du Centenaire*, Supplement *BIFAO* 81 (1981), 379ff.

[14] Kawa I and II; idem, *Allen Memorial Art Museum Bulletin* 23 (1966), 42–71.

[15] *Studien,* 33 and *Meroitica* 1 (1973), 127–144: 5 plus 67 generations.

[16] *MIO* 13 (1967), 1–44 and *Meroitica* 1 (1973), 147–160: 5 plus 73 rulers; idem, *Africa in Antiquity* II (Brooklyn, 1978), 16f. and *Festschrift für Steffen Wenig zum 65. Geburtstag* (Nürnberger Blätter zur Archäologie. Sonderheft Sudan, 1999), 181–182: 6 plus 76 rulers.

[17] Summary: Hintze, *Meroitica* 1 (1973), 135ff., with discussion of the conceivable historical scenario; see also Wenig, *Meroitica* 1 (1973), 152ff.

[18] Even in view of new data from the field, such as the finds at Gebel Barkal, with Bar. P-26 from the mid-6th century BC. This tomb is decorated with an astronomical ceiling: F. Berenguer, *Kush* 17 (1997), 108ff.; eadem, in: Welsby, *Research*, 55–63. Berenguer refers to P-26 as a royal tomb. It has only two chambers, yet contains a *serekh* with a name; there were no foundation deposits.

[19] The difficulties concern, e.g., the assignment of Nu. 20 and the position of Amanibakhi (Gen. 26) in the sequence; the stela from his chapel and an offering table were discovered in Nuri (RCK II, 269, fig. 213; R. J. Leprohon, *CAA Boston Museum of Fine Arts* 3, 127), but no tomb can yet be assigned to him. The sequence and relative chronology of the Neo-Ramesside rulers are also problematic, but according to their

be said of the Meroitic material, where the situation is significantly more complex. In a fundamental review, Hofmann underscored the necessity of systematically utilizing Hellenistic and Roman imports in the tomb inventories for dating purposes,[20] but her work leads to a number of controversial problems, the most important being Hofmann's attribution of royal pyramids to persons whom she considers ruling kings. She bases her attibutions on offering tables with royal benediction formulas K, L, and C', but the offering tables were not found in the royal necropolis itself. Furthermore, royal benediction formulas could also presumably have been used for members of the royal family.[21] Török discusses the chronological issues in the context of the publication of the *Fontes Historiae Nubiorum*.[22] A further difficulty in ascribing pyramids to known rulers ignores the fact that some pyramids were torn down (e.g., Beg. N. 53) or built over in antiquity.

Wenig's proposal that stylistic elements be given more attention, and Hofmann's call for a more systematic examination of imports among the funeral deposits were virtually ignored, because the poorly preserved tomb chapels at Begerawiya have been inadequately explored archaeologically. The challenges presented by interdisciplinary research essential for dating the imports and evaluating their chronological and geographical distribution in the Mediterranean are also considerable. Nevertheless the results of the clearance, reconstruction, and documentation of the pyramids of Meroe undertaken by Friedrich Hinkel and Janice Yellin and others, should eventually produce new evidence relevant to chronological issues.[23]

The relative chronology of the royal tombs, epigraphic sources, and other monuments furnish the foundations for establishing the sequence of the kings of Kush. Since the mechanism of succession remains unclear,

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titularies and the language of the texts (for which see now C. Peust, *Das Napatanische: ein ägyptischer Dialekt aus dem Nubien des späten ersten vorchristlichen Jahrtausends* (Göttingen, 1999), 70–71) they belong at the end of the Napatan period. According to Morkot, in: *Centuries of Darkness*, P. James et al., eds., (London, 1991), 216f., the Neo-Ramesside rulers should be assigned to the period before Dyn. 25; more cautious idem, *The Black Pharaohs* (London, 2000), 146–150; see further below.

[20] Hofmann, *Chronologie*, passim (p. 192: 6 plus 69 rulers).

[21] Hintze, *Studien*, 62–63; Rilly, *MNL* 28 (2001), 81.

[22] See the paragraphs for the reigns under discussion in FHN I–III.

[23] Hinkel began studying the pyramids in 1976; there are 169 relief scenes at his disposal compared to 52 previously available; see Hinkel in: K. Bard, ed., *Encyclopedia of the Archaeology of ancient Egypt* (London, 1999), s.v. Meroe; idem, *Meroitica* 7 (1984), 310ff.

and since succession from one generation to the next is paralleled by collateral succession among brothers and cousins, it is virtually impossible to project life spans and lengths of reigns from a change of sovereign. Genealogies established for individual sovereigns are largely based on circumstantial evidence or on conjecture about possible rules of succession; they are rarely certain and apply only to specific cases.[24] For example, Assyrian sources designate Tanwetamani as the son both of Shabaka[25] and of Taharqa's sister.[26] His presumed mother is Qalhata, who should accordingly have been Taharqa's sister and Shabaka's consort. Her titles define her only as *mwt nswt, snt nswt, ḥnwt n tꜣ-stj* and possibly *zꜣt nswt* (?),[27] but not *ḥmt nswt* which is, however, not among the titles of any Kushite royal mother documented to date. Either these women were not royal wives, or the title *ḥmt nswt* was deemed irrelevant for them, possibly because it was considered a lower ranking title, for even in those cases where the husband may have been king, he was dead at the time his son was proclaimed king. The reconstruction of kinship ties is rendered even more difficult since it is not known whether the Kushites employed the terminology in a literal sense, or whether terms such as *snt* "sister" and *sn* "brother" had broader connotations.[28] For the period after Aspalta, who traced his maternal line back seven generations,[29] there is either very little genealogical or historical information, or none at all. The evidence and conjectural data suggest only that fully adult men ascended the throne.[30]

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[24] For a current, reliable study, see Morkot, *Meroitica* 15 (1999), 218–219, comparing idem, in the Preprint of the *7th International Conference for Meroitic Studies, Part 3, Appendix*, 1992, 1–39 and especially Morkot's remarks on the royal succession in Dyn. 25, *Meroitica* 15 (1999), 202–209.

[25] Egyptologists, except M. A. Leahy, *GM* 83 (1984), 43ff., consistently consider Shabaka in error for Shebitku. However, it is improbable that the Assyrians erred in the filiation of their opponent, citing a king who had been dead for 43 years.

[26] See R. Borger, *Beiträge zum Inschriftenwerk Assurbanipals* (BIWA), 24 (A II 22 B II 10) and 214f.

[27] A. Lohwasser, *Meroitica* 19 (2001), 180f.

[28] Cf. D. Apelt, *Meroitica* 12 (1990), 23ff.

[29] In his coronation stela: N. Grimal, *Quatre stèles napatéennes au Musée du Caire: JE 48863 et 48866* (Cairo: MIFAO 106, 1981), 30, 12–31, 3. The cartouches were all defaced. For one possible reconstruction and the problems it entails, see Morkot, *Meroitica* 15 (1999), 196–200 and my review of *Meroitica* 15, *OLZ* 98 (2003), 441.

[30] Arike-Amanote, e.g., states that he was 41 years of age (Kawa IX, l. 4). Tanwetamani, Shabaka's son, may have been in his mid-40's. If Taharqa left Nubia in 701 as a 20 year old (Kawa V, l. 20) to participate in the battle of Eltheke (K. A. Kitchen, in: *Fontes atque pontes: eine Festgabe für Helmut Brunner* (Wiesbaden: ÄUAT 5, 1983, 249ff.), then he may have been about 31 when he ascended the throne; Sabrakamani (Kawa XIII. l. 2) gives his age as 39 (?).

Similarly, it is not known whether the ruling sovereign influenced the nomination of a crown prince, if indeed such an institution existed (no source preserves a term for it).[31] Kawa Stelae IV, 7ff. and V, 13ff. state that Shebitku appreciated Taharqa more than any of the other royal "brothers", but this need not necessarily imply that Shebitku considered Taharqa crown prince.[32] On the other hand, the Assyrian sources report that in 671 BC, Esarhaddon captured Taharqa's *crown prince* Ushanahuru.[33] But other Assyrian sources refer only to *his son*.[34] Kushite sources, and particularly the election stela of Aspalta, appear to testify against the practice of designating a successor.

The only reign in more than twelve centuries of Kushite history whose length and absolute dates are known is Taharqa's (690–664 BC), fifth king of Dyn. 25 and eleventh (?) sovereign of Kush. The dates and lengths of his predecessors' reigns, especially those of his immediate predecessor Shebitku (who had ascended the throne by 707 as the Tang-i Var inscription shows—see further below) and the others back to Alara (the first Kushite ruler whose name is known),[35] must be reckoned from this point, as well as those of his successor Tanwetamani and the later Early Napatan rulers up to Aspalta. All other dates for Kushite rulers, particularly pre-Dyn. 25, but also those of the Napatan period after Aspalta, are estimates. There is a single certain date for the entire Meroitic period: 10 April 253 AD, in regnal year 3 of Teqorideamani (Beg. N. 28).[36] All other year dates of this period are based on logical deductions from indirect testimony and historical considerations, frequently deriving from Classical sources. Some of these

[31] I doubt that *ḥwn* "youth" was such a designation (as Macadam suspected, *Kawa* I, 53 [6]). Taharqa, e.g., travelled to Egypt in the middle of the *ḥwnw nfrw* (plural), according to *Kawa* IV, l. 8. The Adoption stela, l. 4, describes Psammetichus II as *jṯj jwʿ Gb dmḏ psšwy m ḥwn*, and even Amasis is *ḥwn nfr*. Cf. also Zibelius-Chen, in: T. Kendall, ed., *Nubian Studies 1998* (Boston, 2004), 468.

[32] As Macadam assumed, *Kawa* I, 17 (19).

[33] See R. Borger, *Die Inschriften Asarhaddons, AfO* Beih. 9 (1967), 99.

[34] In Chronicle 1 (A. K. Grayson, *Assyrian and Babylonian Chronicles* [Locust Valley, 1975], 85) there is only a reference to his (i.e., Taharqa's) son and brother. See also J. Börker-Klähn, *Altvorderasiatische Bildstelen* (Mainz, 1982) Nos. 217. 218. Whether the Zincirli stela also depicts Ushanahuru is uncertain. According to Börker-Klähn, ibid., No. 219, the person wearing an uraeus could be Taharqa; however, Taharqa was not himself captured by Esarhaddon.

[35] For the nameless predecessors of Alara and their chronological classification, see Kendall, *Meroitica* 15 (1999), 3–117.

[36] Demotic graffito of Pasan (Ph. 416).

estimates are well founded while others are conjectures. As a rule, neither the accession dates of Kushite kings nor their reign lengths are known, and only rarely can they be inferred.

The reign of Taharqa (Gen. 5) depends upon the absolute dates of Dyn. 26 and those of its first king, Psammetichus I, whose first regnal year falls in 664 BC.[37] The stela Louvre 192 from the burial of an Apis bull in the Serapeum mentions that it was born in Taharqa's year 26 and enthroned in the same year on 9/IV/*peret*; the bull died on 20/IV/*shemu* in year 20 of Psammetichus I, having lived 21 years. In our calendar, the bull's death occurred on February 25, 644, and its enthronement on September 11, 665. Accordingly, Taharqa's year 26 is the Egyptian year which lasted from February 6, 665 to February 4, 664, when he died in the course of his 27th regnal year, having reigned 26 full years between 690 and 664 BC.[38]

The virtually certain sequence of Taharqa's predecessors in Dyn. 25 is supported by the relative chronology of their pyramids, their inscriptions, and their representations. Assyrian synchronisms, together with the Tang-i Var inscription, show that Shebitku (Gen. 4) was already king in 707, or at the latest in 706. After Yamani of Ashdod fled by sea from the Assyrians in 711 and had dwelt "like a thief" in "the area of Egypt at the border by/to Kush", he must have been handed over to the Assyrian king Sargon II by the king of Meluḫḫa/Kush in the year 706 at the latest. According to the Tang-i Var inscription and the version from Malatya,[39] this king is Shebitku. There is no evidence in favour of a supposed vice-royalty in Kush with Shebitku regent for Shabaka ruling in Egypt, nor for suggesting a coregency between the two kings, theorized to salvage the old chronology with its "anchor date" of 712 for the postulated campaign of Shabaka against or into

[37] Beckerath, *Chronologie*, 41, 84–88.

[38] Beckerath, *Chronologie*, 91. According to Beckerath, *SAK* 29 (2001), 1 his first year began antedating on 12 February 690 BC.

[39] G. Frame, *Orientalia* 68 (1999), 40 [20]; N. Na'aman, *NABU* 3 (1999), 63 [65]. For the chronological implications and interpretation of the historical/political events, see B. U. Schipper, *Israel und Ägypten in der Königszeit* (Fribourg, 1999, OBO 170), 200ff.; K. Dallibor, *Der antike Sudan* 11 (2001), 41ff.; D. Kahn, *Orientalia* 70 (2001), 1ff. and above all, A. Fuchs, *Die Annalen des Jahres 711 v. Chr. nach Prismenfragmenten aus Ninive und Assur*, The Neo-Assyrian Text Corpus Project (Helsinki 1998), 124ff. who reached the same conclusion about the date of Yamani's extradition before the Tang-i Var inscripton was made public. Note that D. B. Redford, *Orientalia* 68 (1999), 58ff. and K. A. Kitchen, in: Bietak, ed., *SCIEM Haindorf 1996/98*, 50f., as well as Beckerath, *SAK* 29 (2001), 1ff., are sceptical of the value of these new sources.

Egypt.[40] Consequently, D. Kahn rejects such ideas.[41] A division of power is documented neither for Piankhi nor Taharqa. That the Assyrians would have referred to the junior, less powerful ruler, is improbable. And why indeed should they not have mentioned both rulers of Egypt and Kush in their propaganda? It is more logical to suppose that Shebitku at his accession handed over Yamani, after he had spent some time in Egyptian-Kushite territory. Such an act might be viewed as a friendly gesture, since Yamani was an outlaw in Assyrian eyes, while in Egypt he could have stirred up trouble, perhaps seeking political support against the Assyrians. Both domestic and foreign policy could thus have provided motives for his extradition. Simultaneously, it might have served as a warning for the Delta princes to keep them in line. This scenario is, however, pure speculation, since neither the place of Yamani's sojourn nor what he did is known. Regardless, Shebitku did not want Yamani on his territory, and he failed to find asylum for him elsewhere, although committing himself to the anti-Assyrian alliance at Eltekeh shortly thereafter (701). Here, the petty rulers stood in battle array beside the Kushite army and their allies, as the Assyrian king Sennacherib specifically states;[42] the Delta rulers were thus still to be reckoned with, despite more than 30 years of Kushite rule in Egypt.

Shebitku's reign can be calculated at a minimum of 17 years, 707–690. Africanus gives him 14 and Eusebius, 12. By contrast, his highest known date from Egypt is year 3.[43] His involvement in the Near East can only be grasped by studying Assyrian and Old Testament sources, as is also true for Taharqa.[44]

The accession of Taharqa's successor in 664 is certain. According to the Dream Stela ll. 6f.,[45] Tanwetamani (Gen. 6) proceeded to Egypt in his first year, passing through Napata and Elephantine on the way to reclaim the Delta which had been lost to the Assyrians in 667. Indirect confirmation comes from Assyrian sources which refer to the change of rulers, noting that Tanwetamani made Thebes and Heliopolis his major bastions. Assyrian sources report that Tanwetamani was

[40] So, Beckerath, *SAK* 29 (2001), 4–5.
[41] *Orientalia* 70 (2001), 6–7.
[42] E. Frahm, *Einleitung in die Sanherib-Inschriften, AfO* Beiheft 26 (1997), 59.
[43] Nile Level mark No. 33 in Karnak; Kitchen, *TIP*³, § 126.
[44] On Assurbanipal's battles against Taharqa and Tanwetamani, see the edition of textual sources by Borger (n. 26), 210–215.
[45] Grimal (n. 29), 7, 11f.

expelled from Thebes shortly thereafter (probably within only a matter of months).[46] With the installation of Nitocris as God's Wife in Thebes by Psammetichus I ca. 655, Tanwetamani's rule in Upper Egypt ended. There is no hint of how long he continued to rule Kush. Using Greek sources, Burstein[47] plausibly argues that Tanwetamani did in fact return once to Memphis, where he fought Psammetichus I who had engaged the aid of Carian mercenaries. Tanwetamani was buried in the royal necropolis at Kurru, in Ku. 16.

Psammetichus I fortified Elephantine and campaigned in LN,[48] but the identity of his Kushite opponent is not certain; chronologically, it could be either Atlanersa or Senkamanisken.[49] With the withdrawal of the Kushites from Egypt, Nubia sank into obscurity. Until the mid-4th century AD, which marks the end of the Meroitic kingdom, there were at least another 61 kings, but dated monuments are associated with few of them. Synchronisms with Egypt provide chronological fixpoints soley for the early Meroitic Period. Otherwise, there exists only Reisner's relative chronology, based on the typological criteria of the royal tombs and emended since only in some specific cases. Estimates of average reign lengths have been made, working with the number of kings between accepted fixpoints of the absolute chronology and by comparison with Egyptian data of different periods; but these remain hypothetical. The proposed dates are merely suggested reference points indicating approximate positions, by contrast to Egyptian chronology for the LP, which is certain after 664 BC.

The sequence of kings for the generations following Tanwetamani until Malonaqen (Gen. 12), based on archaeological seriation and inscriptions, is resonably reliable. The succession Atlanersa—Senkamanisken follows from the addition of the latter's name to the barque stand of Atlanersa (MFA 23.728).[50] Senkamanisken also completed Temple B 700 at Barkal, begun by Atlanersa. Since the succeeding kings Anlamani[51] and Aspalta[52] were both children of Nasalsa, it is clear that they were

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[46] Borger (n. 26), 214 (B § 13, II 10–17).

[47] *JSSEA* 14 (1984), 31ff.

[48] L. Habachi, *Oriens Antiquus* 13 (1974), 323ff.

[49] A fragment of an offering table belonging to Senkamanisken was found in Memphis: Zibelius-Chen, *Meroitica* 15 (1999), 712.

[50] Dunham, *Barkal Temples*, 32 (15); cf. also Reisner, *ZÄS* 66 (1930), 91–92.

[51] Kawa VIII, representation in the lunette and ll. 22f.

[52] Stela of Madiqen from year 3, representation in the lunette, and on the stela of Khaliut. For the latter, see M.B. Reisner, *ZÄS* 70 (1934), 40 (13).

brothers. Indirect evidence correlates Aspalta with Psammetichus II who campaigned against Nubia in 593, his 3rd regnal year.[53] Traces of destruction at Napata which affected the monuments of Kushite rulers up to and including Aspalta (with later monuments untouched) are associated with Psammetichus's incursion. Ash layers were found in the corresponding levels of Palace 1200 and in Temple B 500. Fires were likewise confirmed in the temple and "treasury" at Sanam, where the latest royal name found is Aspalta's. The chronological position of Aspalta thus inferred[54] was confirmed by the discovery of statues of Taharqa, Tanwetamani, Senkamanisken, Anlamani and Aspalta in a cachette in the temple precinct at Doukki Gel (Kerma),[55] all showing deliberate damage (including the removal of royal insignia).

Generations 11 to 27, following Aspalta, span about three centuries, from the second quarter of the 6th century to the end of the 4th century BC (ca. 570–315 BC). Burials have been confirmed for 15 of the 17 kings postulated. One tomb (Ku. 1), with a very large pyramid, is still unattributed, as is Ku. 2, presumably the burial of the consort or mother of Ku. 1's owner. The temporary return from Nuri to the old royal necropolis at el-Kurru may reflect a brief change of dynasty. King Amanibakhi's mortuary stela and his offering table were discovered reused in Nuri 100,[56] but the king's pyramid has not yet been identified. He is tentatively placed before Nastasen (Gen. 27).[57] Only a few royal monuments are known in this sequence before Nastasen, and those citing regnal years are quite rare. The highest known year for Aspalta is 3. For Arike-Amanote year 25+x is attested[58] and from Kawa

[53] For stelae of the king at Shellal, Karnak, and Tanis, see P. Der Manuelian, *Living in the Past* (London 1994), 337ff. Psammetichus II ascended the throne on 19/I/595 BC (W. Barta, *ZÄS* 119, 1992, 89); his campaign in year 3 thus took place in 593 BC.

[54] Most recently, Kendall, *Kush* 17 (1997), 232ff.; but cf. Török, FHN I, 230–231, who considers the evidence insufficient for concluding that the Egyptian army reached and destroyed Napata. Török thinks that the destruction could have resulted from a natural disaster or local political conflicts, in which case the survival of the Khaliut stela undamaged and in situ is remarkable. Unfortunately it bears no date. Also undamaged are the stela of Madiqen (dated to year 3; perhaps originally erected in Sanam), the inscriptions on the sphinx of Defeia, and the tomb and sarcophagus of Aspalta. Thus Aspelta could hardly have been the victim of persecution, as frequently claimed.

[55] For the find, see C. Bonnet, *Genava* 51 (2003), 267ff.; D. Valbelle, *RdE* 54 (2003), 199.

[56] *RCK* II, 269 fig. 213; for the stela, see also Leprohon (n. 19), 127ff.

[57] So now also Török, *FHN* II, 465.

[58] *Kawa* XII.

inscription IX, 4 it emerges that his predecessor was Talakhamani (Nu. 16). Thus the typological sequence postulated by Reisner has been confirmed by epigraphic evidence.[59] The mention of the ruler Malowi-Amani in Kawa IX, 12 demonstrates that he should be considered the immediate predecessor of Talakhamani.[60] The annals of Harsijotef (Gen. 23) fall in his year 35,[61] and those of Nastasen (Gen. 27) in his year 8.[62]

Archaeological remains confirm that after the campaigns of Psammetichus I, LN was subject to Egyptian hegemony. Even under the Achaemenids, in Dyn. 27, the fort at Dorginarti remained for some time under northern control. Kushites appear as tribute bearers in the Apadana reliefs at Persepolis under Darius I, but their costume does not correspond to the Kushites' own imagery. On the statue of Darius I from Susa, *tꜣ-nḥsj* is listed among the occupied countries, along with Egypt and Libya. Cambyses is supposed to have attempted an invasion of (Upper) Nubia; and Xerxes deployed an Ethiopian contingent in his invasion of Greece.[63] The inscriptions of the Kushite kings Harsijotef and Nastasen reveal that they fought in LN, confirming that the region was then no longer subject to northern rule. Apparently, Kushite control extended northwards during the era of Egyptian independence from Persian rule, Dyns. 28–30 (404–342 BC). Harsijotef (Nu. 13) is thus placed around 404. It seems that Kushite kings also remained active in LN during the last phase of the Second Persian Period in Egypt, as Nastasen names *Ḫmbswdn* as the enemy in LN.[64] Hintze, citing linguistic and historical arguments, equated this foe with the Egyptian rival king Khababash,[65] a proposal that strongly influenced the chronological position assigned to Nastasen and resulted in his being dated ca. 335–315 BC.[66] Although this identification of Nastasen's

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[59] Macadam's proposal of a coregency between Talakhamani and Arike-Amanote was justly refuted by Vinogradov, *Atti I. VI Congresso Internazionale di Egittologia* (Turin, 1992/93), 635ff.

[60] So, too, Reisner *HAS* II (1919), 58.

[61] L. 1: Grimal (n. 29), 42, 2.

[62] L. 1: Peust (n. 19), 34.

[63] L. A. Heidorn, in: W. V. Davies, ed., *Egypt and Africa: Nubia from prehistory to Islam* (London, 1991), 206ff.; Morkot, in: *Achaemenid History Workshop* 6 (Leiden, 1991), 324ff.

[64] L. 39; on the reading of the name, see most recently, Peust (n. 19), 210–211.

[65] *Studien*, 17–20.

[66] On Khababash, who should probably be dated to 343–332 BC, see recently F. Hoffmann, *Ägypten* (Berlin, 2000), 87 note 145. See also Peust (n. 19), 210–211. For the chronology of the Second Persian Period in Egypt, see D. Devauchelle, *Transeuphratène* 10 (1995), 35–43 (*non vidi*).

opponent (presumably a LN prince), is most assuredly inaccurate,[67] the position of Nastasen in the sequence is unaffected. In terms of the general time scale, placing him somewhere in this era seems to be entirely reasonable, given the dates proposed for the early Meroitic king Arkamani-qo and the insertion of the so-called Neo-Ramesside rulers after Nastasen.

The five "Neo-Ramesside" kings, Gen. 28–32, have been placed between Nastasen, the last king to be buried in Nuri (Nu. 15), and the first Meroitic king to be buried in Begerawiya South (Beg. S. 6). They are Aktisanes,[68] Ary(amani),[69] Kash . . . meri-Amun,[70] Arike-Pi(ankhi)-qo, and Sabrakamani.[71] But using archaeological criteria, it is possible to associate only three of the five with burials, viz. the anepigraphic Barkal pyramids Bar 11, 14, and 15, which belong between Nu. 15 and Beg. S. 6, the first royal burial at Meroe.[72] Ascribing the pyramids to specific Neo-Ramesside kings is, however, completely hypothetical. Moreover, these kings are viewed as a group and placed in the same period solely on account of their names.[73] Their proximity to Amanislo (Gen. 34), buried in Beg. S. 5, and their position before Arnekhamani *mrj-Jmn* (Gen. 36), the builder of the Lion temple at Musawwarat es-Sufra may, however, be viewed as certain. Arnekhamani, buried in Beg. N. 53, was the last king to bear the epithet *mrj Jmn* (see below).[74] Amanislo and Amani-tekha[75] (Gen. 35) also used the epithet. However, it is not clear whether all five Neo-Ramesside kings form a single group in the period between Nastasen (Gen. 27) and Arkamani-qo (Gen. 33).

[67] Hintze identified the last part of the name as Meroitic *wte* (for *wte*, see now Rilly, MNL 27 [2000], 105 n. 5). It is, however, highly improbable that such a positive epithet would be attached to the name of an opponent; see A. S. Spalinger, *ZÄS* 105 (1978), 147. Furthermore, Khababash was chiefly active in LE.

[68] For *Gtsn/Ktsn* see K.-H. Priese, in: *Fs Hintze*, 343ff. Beckerath, *Handbuch*², 275, "Atiaa-qo" is to be corrected; likewise, the mistaken data for H, G, and N names of Arike-Amanote (Beckerath, *Handbuch*², 273). Diodorus I, 60 records an Ethiopian king Aktisanes, who might be identical with *Gtsn/Ktsn*. Diodorus took the name from Hekataios of Abdera, a contemporary of Ptolemy I, whose work must have been composed before 300 BC; thus Aktisanes should be dated to before 300, or at the very latest, before 282 BC.

[69] Kendall's identification as Alara (*Meroitica* 15 [1999], 64) cannot be maintained.

[70] Cf. Beckerath, *Handbuch*², 275 Arkamanikasch . . . (?).

[71] All but Aktisanes are documented only in Kawa. See Macadam, *Kawa* I, 72ff. (XIII, XIV, XV), 90 (XLV).

[72] See Wenig, *MIO* 13 (1967), 1ff.

[73] I.e., the epithet *mrj-Jmn* written in the cartouche with the nomen of Kash . . ., Ary(amani) and Sabrakamani.

[74] Priese, in: *Fs Hintze*, 351ff. See also above, note 14.

[75] Probably restored correctly as Amani-tekha *mrj-Jmn* by Beckerath, *Handbuch*², 277.

Peculiarities of writing and diction in the inscriptions of Sabrakamani and Arike-Pi(ankhi)-qo led Priese to date them earlier in the Napatan era, before Nastasen,[76] whereas Hofmann places Sabrakamani and Kash . . . amani in the Meroitic period (as Gen. 39 and 40), assigning them the later pyramids Bar. 7 and Bar. 9 in the north group at Gebel Barkal.[77] But this would imply that these two kings temporarily revived the tradition of using the epithet *mrj-Jmn* in their cartouches after a lapse of several generations. In the absence of additional arguments, this proposal does not seem very appealing. Positioning the Barkal pyramids 7 and 9 between the necropoleis of Nuri and Begerawiya led to the rejection of the idea of a First Collateral dynasty at Napata.

Typologically, the tombs Beg. S. 6 und Beg. S. 5 at Meroe immediately follow the pyramids of the southern group at Barkal. They belong to kings Arkamani-qo (Gen. 33) and Amanislo (Gen. 34). According to Diodorus III, 6, the Ethiopian king Ergamenes was a contemporary of Ptolemy II (285–246 BC) and the first to oppose the priesthood and their custom of ritual regicide. This information resulted in the identification of Ergamenes with Arkamani-qo, and thus to establish him approximately in the 2nd quarter of the 3rd century BC. The transfer of the royal necropolis from Barkal to Meroe in Arkamani-qo's reign also contributed to his identification with Ergamenes, as the move could have been related to the latter's opposition to the priesthood.[78]

After Amanislo, the sequence of royal tombs at Meroe continues in the northern area of Begerawiya. Of 41 tombs, at least two must be assigned to princes, and one to a non-reigning queen. The uncertainty of ascribing tombs in this cemetery results from the use of two-chambered tombs for kings after the turn of the 2nd to the 1st century BC. Previously kings owned three-chamber tombs while two-chamber tombs were used for non-ruling members of the royal family. Since the non-ruling members continued to be buried in two-chamber tombs, it is difficult to identify the burial of a king when the reliefs in the tomb chapels have been destroyed, as is frequently the case; or when tomb stelae and offering tables are not preserved in situ. Furthermore, kings are usually not distinguished by the use of their title *qore* in the

[76] In: *Fs Hintze*, 352f.
[77] *Chronologie*, 65–66.
[78] F. Hintze, *Die Inschriften des Löwentempels von Musawwarat Es Sufra* (Berlin, 1962), 16f.

nomination of the funerary texts. The series of tombs in the northern cemetery was interrupted for three generations by a move to Barkal, but then the sequence was resumed and maintained in the north cemetery until the end of the Meroitic kingdom.

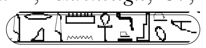
Associating individual pyramids with known kings to establish a chronological sequence is thus a particularly difficult task in this cemetery. The first tomb, Beg. N. 4, belongs to Amani-tekha who, distinguished by the epithet *mrj-Jmn* in his cartouche,[79] follows Amanislo closely. The chronological position of Arnekhamani (Gen. 36), builder of the Lion Temple at Musawwarat es-Sufra, who has been assigned the destroyed pyramid Beg. N. 53, has been deduced from the repeated changes of epithet in his cartouche. *Mrj-Jmn* he first altered to *ʿnḫ ḏt mrj-Jmn*, and then to *ʿnḫ ḏt mrj-Jst*. This last epithet naming Isis is used in Egypt only by Ptolemy IV (221–205 BC). Presumably Arnekhamani ascended the throne during the reign of Ptolemy III (246–221 BC), and subsequently changed his name, when Ptolemy IV became pharaoh.[80] Arqamani/Ergamenes II (Gen. 37; Beg. N. 7) and Adikhalamani/Tabirqo?[81] (Gen. 38; Beg. N. 9) used the same epithet. They should therefore be successors of Arnekhamani, especially since Arqamani might be identical with the son of Arnekhamani who appears in the reliefs of the Lion Temple at Musawwarat es-Sufra.[82] A chronological niche for Arqamani and Adikhalamani is easily defined, since both built in the Dodekaschoinos in LN,[83] and can only have done so (for political and chronological reasons) during the Theban secession between 207/6 and 186 BC.

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[79] See above, note 75.

[80] Hintze (n. 78), 14f. The Egyptian rival king *Ḥr-wn-nfr* likewise takes the epithet *ʿnḫ-ḏt mrj-Jst* along with others at his coronation in Thebes, 205 BC, see W. Huß, *Ägypten in hellenistischer Zeit* (München, 2001), 446 and P. W. Pestman, *Chronologie égyptienne d'après les textes démotiques* (Leiden, 1967), 44.

[81] Possibly a mortuary name of Adikhalamani.

[82] Hintze, (n. 78), 25 (10). However, Hofmann, *Chronologie*, 57, rightly argues that Prince Arka  cannot be Arqamani  (Dakke; RCK IV, fig. D no. 24 G) because the orthography of the name is quite different, but she does concede that his chronological position after Arnekhamani could be correct.

[83] Chapel of Ergamenes in the temple of Dakke (G. Roeder, *Der Tempel von Dakke*, Cairo, 1911) and chapel of Adikhalamani in Debod (G. Roeder, *Debod bis Kalabsche*, Cairo, 1911); see also a stela of the latter in Philae (A. Farid, *MDAIK* 34 [1978], 53–56). For the alleged joint constructions of Meroites and Ptolemies in the Dodekaschoinos, see Török, *Handbook*, 210–211, 428–431.

The tombs continuing the archaeological sequence in the northern cemetery can be assigned to specific individuals only with difficulty. Relevant epigraphic material is generally lacking, and attributions on the basis of fragmentary and displaced offering tables can be no more than provisional. A ruling queen must have been interred in the pyramid Beg. N. 11 (Gen. 41), where the reliefs depict a woman with royal insignia. Shards with Demotic and Meroitic cursive characters have been found in the debris, supporting attribution of it to Sanakadakhete. The earliest known inscription in Meroitic comes from Temple F which she built in Naqa. An iconographic detail leads Hofmann to correlate the pyramid with the later part (after 145 BC) of the reign of Ptolemy VIII (170–163, 145–131, and again 127–116 BC).[84] A block from a pylon with traces of a Horus name with the component *kꜣ-nḫt* comes from Beg. N. 20 (Gen. 44). Ptolemy IX (116–107 and 88–80 BC) and Ptolemy XII (80–57 and 55–51 BC) use *kꜣ-nḫt* in their Horus names, suggesting to Wenig that the pyramid Beg. N. 20 belongs to the Meroitic king Taneyidamani, who is known from many monuments and must belong to this period.[85] However, Hofmann and Török consider him the immediate successor of Sanakadakhete, and therefore assign him pyramid Beg. N. 12 (Gen. 42).[86]

After Beg. N. 20, the royal family moved the burial ground to Barkal for three generations, before returning to Begerawiya North for the remainder of Meroitic history. Only one of the three tombs at the latter site can be assigned, viz. Bar. 6 to the ruling queen Nawidemaka. Other identifications depend upon differing interpretations of the historical events that may have led to the transfer of the necropolis.[87] Since the assignment of the tomb group Beg. N. 11, 12, 13, and 20 is already hypothetical, and the sequence of kings accordingly contested, any interpretations amount to mere circular reasoning until new material comes to light.

Epigraphic documentation for three personalities—king Teriteqase, Kandake Amanirenase and Paqara Akinidada—at the temple of Dakke[88]

[84] *Chronologie*, 77–78.

[85] *MIO* 13 (1967), 43.

[86] Hofmann, *Chronologie*, 78. Török notes palaeographic details favouring Taneyidamani for Sanakadakhete's immediate successor, *Handbook*, 205; idem, *FHN* II, 664.

[87] But not, in my opinion, an active northern policy (cf. Hofmann, *Chronologie*, 66ff.), since the kings of Dyn. 25 had a decided northern policy with the seat of government in Egypt, yet were buried in Kush.

[88] *REM* 0092; *REM* 0093.

is chronologically very significant. Queen Amanirenase, who apparently reigned after the death of Teriteqase, is attested together with Akinidada in Kawa and in Hamadab.[89] Akinidada may be the son of the one-eyed Kandake mentioned by Strabo.[90] Akinidada is also named with the reigning queen Amanisakheto (Beg. N. 6) on a stela in Qasr Ibrim.[91] These four individuals must have been not only contemporaries, but also apparently associated with historical events linked to a more aggressive northern policy, which led to the Meroitic conquest and pillage of Philae and Syene and provoked the conflict with the Romans, resulting in Petronius's campaign of 23 BC. With the peace of Samos 21/20 BC, both parties were satisfied with the Roman garrison's withdrawal from Qasr Ibrim while the Meroites recognized the border at Maharraqa.[92] Only in 297 AD did Diocletian move the frontier back to Syene, but exactly how the Romans ruled LN during their years of sovereignty, and the degree to which the Meroites may have been involved, cannot be established with certainty. Demotic graffiti in the Dodekaschoinos, dating for the most part to the 1st and 3rd centuries AD, testify to the activities of Meroitic officials in the region. The cult of Isis at Philae was particularly important to them, and defensive actions against the aggressive and marauding Blemmyes will have been a common concern of Romans and Meroites. The Kharamadoye text in the Mandulis temple at Kalabsha is the last Meroitic inscription in the region;[93] it dates to the beginning of the 5th century AD.[94] Whether King Aqrakamani (*ꜣqrg-ꜣmnꜣ*) should also be assigned to the period of conflict with Petronius remains unclear.[95] A Demotic inscription of a Meroite in Dakke belongs to his reign and that of his royal mother, the *pr-ꜥꜣt* Naytal (*Njtl*).[96]

[89] *REM* 0628; *REM* 1039.

[90] Strabo 17, 1. 53f.; see *FHN* III, 828ff. (190).

[91] *REM* 1141; cf. also *REM* 0705. 0706 in the temple T at Kawa.

[92] Summary of the historical events according to Roman sources: Welsby, *The Kingdom of Kush: the Napatan and Meroitic Empires* (London, 1996) 68ff.; Török, *Handbook*, 448ff.

[93] For the dates, see Török, *FHN* III, 1105f.

[94] That the Kharamadoye inscription might have been written in a language other than Meroitic (as Peust (n. 19), 75, maintains) is highly improbable. It is precisely post-positions such as -dik or -lw (which Peust cites as indicators of a different language) which are known Meroitic language morphemes, like the lexeme *qore* "king". A glance at the beginning of the inscription, which clearly reveals Meroitic diction as far as line 9, should have discouraged him from pursuing this proposal. For analyses of the inscription, see *Bibliographie REM* 0094 and Millet, *MNL* 30 (2003), 57–72.

[95] Török in: FHN II, 686 (161), without, however, going into A. Burckhardt's arguments in *Meroitica* 8 (1985), 76 and n. 12, where this graffito is assigned to the late 1st or early 2nd century AD.

[96] Dak. 17; cf. Burckhardt, *Meroitica* 8 (1985), 99.

After Amanisakheto come the great Meroitic builders Natakamani (Beg. N. 22) and Amanitore (Beg. N. 1) under whose reign a "Re-Egyptianization" in art and script occurred. The new excavations of the Berlin Egyptian Museum discovered two stelae of Amanisakheto in the temple of Amun at Naqa,[97] built by Natakamani and Amanitore, which may necessitate a reassessment of the sequence of these rulers, unless the two stelae actually come from an earlier building in Naqa,[98] or were perhaps shifted to the Amun temple and left there. Both stelae show the queen with Amesemi, once before Amesemi's consort Apedemak (REM 1293), and once simply together (REM 1294). Studying details of the representations and the finds in the tombs, Hofmann[99] dates Natakamani to the 2nd half of the 1st century AD.

It is uncertain, although entirely plausible, that Sorakarora, who occasionally appears together with Natakamani and Amanitore and may have initially occupied the position of a *pqr(tr)*, should be placed in the sequence of rulers after Natakamani. A relief at Gebel Qeili shows Sorakarora with full royal insignia.[100]

Links with the Roman Empire are lacking for the following epoch, and there are only a few kings attested in inscriptions and by offering tables. The small number of names which belong to known rulers, and those which have been proposed as names of rulers, are mere compilations in list form. Only the pyramids Beg. N. 17, 18, and 19[101] and the late pyramid Beg. N. 28 (of Teqorideamani) can be associated by inscriptions with owners and their sequence established beyond doubt, following Beg. N. 16. Beg. N. 17, 18, and 19 date to the period from somewhat after the mid-1st century AD to the mid-2nd century. However, two offering tables were found in Beg. N. 16, one belonging to

[97] REM 1293 and 1294.

[98] Naqa may already have been documented in the stela of Nastasen as *trrqt*; see Zibelius, *Afrikanische Orts- und Völkernamen in hieroglyphischen und hieratischen Texten* (Wiesbaden, 1972), s.v. *twrkt(t)* and *trrqt*.

[99] *Chronologie*, 128ff.; see also Török, *Handbook*, 461ff.; idem, *FHN* III, 898f.

[100] M. Zach (*GM* 136 [1993], 89ff.) considers Sorakarora a rival of King Natakamani; Hofmann (*Chronologie*, 128) removes him from the list of kings and assigns Beg. N. 15 to him; Török (*FHN* III, 910f.) considers him a ruling king since he wears a royal costume at Gebel Qeili; Zach (*GM* 145, 1995, 105ff.) concurs. See also Wenig (n. 16), 17; idem, *Fs Wenig* (n. 16), 182.

[101] Amanitenamomide (Beg. N. 17), Queen Amanikhatashan (Egyptian hieroglyphs, Beg. N. 18), Tarekeniwala (Beg. N. 19, in the debris of which was found an offering table of Ariteneyesebokhe). Beg. N. 29 probably Takideamani, and certainly Teqorideamani (Beg. N. 18).

Amanitaraqide[102] and the other to Arayesebokhe. Palaeographic and typological features allow earlier pyramid Beg. N. 16 to be ascribed to Amanitaraqide. Arayesebokhe is dated to a later period, since his offering table is typologically younger, and Beg. N. 36 is assigned to him, but there are significant discrepancies in his chronological position.[103] Furthermore, it is by no means clear that both these individuals were kings at all: no other monuments have yet surfaced for either.[104] The assignment of pyramids in the following period also remains entirely hypothetical. For the specific identification of the burials in Hofmann's 6th group of pyramids in Begerawiya North, which she dates from the mid-2nd century to the mid-3rd century, she relies on offering tables with royal benediction formulae found in the West necropolis at Begerawiya, on the assumption that they had been moved.[105] This clearly illustrates the difficulties and uncertainties surrounding the identifications of rulers and their relative chronological positions.[106]

King Amanikhareqerema, who left us the "omphalos" (i.e., a naos) of Napata,[107] two ram statues[108] and a rounded stone with his name found at Naqa,[109] has as yet no tomb at all,[110] unless Beg. N. 37 (Gen. 67)[111]

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[102] His parents are *Mnh̲doke* (B) and *Pisekr* (C). The facsimile *REM* 0816 has *Pisekdo* instead (C), but it is not possible to decide which reading is correct on the basis of the photograph. Pisekara appears in the king lists because kings' fathers are presumed to have been kings too, but this is by no means certain.

[103] For example, Török, *FHN* III, 912–914 places Arayesebokhe as Gen. 56 with Beg. N. 36 immediately after Amanitaraqide with Beg. N. 16. The same sequence appears in Török, *Handbook*, 205, but with Beg. N. 36 assigned to Amanitaraqide and Beg. N. 16 to Arayesebokhe. Hintze, *Studien*, 33 placed Amanitaraqide in Gen. 48 and Arayesebokhe much later in Gen. 60, while Wenig (n. 16), 17; idem, *Fs Wenig* (n. 16), 182) assumes Gens. 56 and 69, and Hofmann, *Chronologie*, 192, assigns them, respectively, to Gens. 52 and 63.

[104] See Rilly, *MNL* 28 (2001), 81.

[105] *Chronologie*, 155.

[106] For example, inserting Maloqorebara (Meroitic chamber in Philae, *REM* 0101 l. 1) in the king list is fraught with difficulties; cf. Török's discussion, *FHN* III, 1028f. Even if a royal name should be expected in *REM* 0101 (so Török) the context of the inscription (*tdh̲e:Mloqorebr:qoretlh̲idemni* . . . .) does not suggest that Maloqorebara should be considered a king. At our present understanding of the language *qoretlh̲idemni* /*qoretalah̲idemani*/ is to be read as *qorese-l lh̲idemni*.

[107] *REM* 1004.

[108] *REM* 0001 and *REM* 1151.

[109] *REM* 1282, with the writing *Mnh̲ereqerem* (*contra* Rilly, *MNL* 28 [2001], 71 n. 1), see the figure, K. Kroeper & D. Wildung, *ANM* 9 (2002), 146 pl. VI a (inverted); G. & J. Hallof, *BzS* 7 (2000), 169ff.; C. Carrier, *MNL* 27 (2000), 2 and figs. 4–5.

[110] Török, *Handbook*, 206 (Gen. 62).

[111] Wenig (n. 16), 17; idem, *Fs Wenig* (n. 16), 182.

or Beg. N. 41 (Gen. 56) is his.[112] Proposed dates range from the 2nd half to the end of the 2nd century. When doubts arose about the late dates for Amanikhareqerema, Rilly attempted to check the chronological position proposed for him by applying palaeographic criteria to the inscription on the stone REM 1282.[113] To avoid circular reasoning, he relied on statistical analyses of the cursive royal inscriptions after Natakamani. His study includes 18 documents, analysed according to strict methodological criteria, while excluding archaeological and iconographic factors. Rilly concludes that the later dates for Amanikhareqerema should be reconsidered, since he may belong instead to the end of the 1st century.

We have almost no names for the kings reigning between Amanikhareqerema and those of around a century later. Many princes and queens were included in the king-list for the last centuries of the kingdom of Meroe, none of whom reigned autonomously. In the corpus studied by Rilly they are: Amanitaraqide, Arayesebokhe, Amanikhedolo, Mashaqadakhela, Temelordeamani, who may have been a half-brother of King Teqorideamani, Pat..rapeamani and Amanipilade.

A maximum list of kings after Natakamani (and Sorakarora?) would include 23 rulers with a total of 24 pyramids. In a minimal list, only the following individuals can be considered kings:

Amanikhareqerema, end 1st century AD
Amanitenamomide (Beg. N. 17)
Amanikhatashan (Beg. N. 18)
Takideamani (?)
Tarekeniwala (Beg. N. 19)
Ariteneyesebokhe
Teqorideamani (Beg. N. 28), accession 248/249 AD
Yesebokheamani

Teqorideamani can be dated precisely; he is named in the Demotic graffito Ph. 416 of Pasan mentioning the third year of the ruler *Tqrrmn* and year 253 (in our reckoning) under Trebonius Gallus. The king's name, written in Meroitic Teqorideamani, was found in his pyramid, Beg. N. 28. We also possess an offering table REM 0829, dedicatory texts REM 0408 through REM 0410, and the graffito REM 1261 in

[112] Hofmann, *Chronologie*, 160.
[113] *MNL* 28 (2001), 71ff.

Meroe inscribed with his name. He may have reigned 20 years.[114] The inscription of his official Pasan and those of other Meroites attest that the personnel of the Isis temple was partially under the authority of Meroitic officials. It is probably in this connection that the representations in the Meroitic chamber at Philae showing a Meroitic delegation should be understood.[115] One of the successors of Teqorideamani was Yesebokheamani, who is attested in a dedicatory inscription on Hadrian's gate at Philae, where he is explicitely titled *qore*.[116] He thus belongs most probably to the period of Roman withdrawal from the Dodekaschoinos.[117] His lion statue was found in Qasr Ibrim in LN,[118] and he is also known from a stela in the Apedemak temple at Meroe, with an inscription identifying him as king.[119]

The sequence of pyramids in Begerawiya North ends with Beg. N. 25. This tomb belonged to a queen who is depicted wearing royal insignia and sitting on a lion throne to receive an offering of incense.[120] The pyramid Beg. N. 25 represents the last burial in the royal necropolis at Begerawiya North, marking the end of the Meroitic kingdom.

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[114] Deduced by Hofmann, *Chronologie*, 168, based on Ph. 68, where year 20 of a Meroitic king is mentioned.

[115] *REM* 0097–0111.

[116] *REM* 0119 and *REM* 0120. On *qoro* < *qore-lo* see Rilly, *MNL* 26 (1999), 79ff.

[117] See Török, *FHN* III, 1050; contrast Hofmann, *Chronologie*, 189.

[118] Not in *REM*. See J. M. Plumley, *JEA* 52 (1966), 12, pl. 4, 3. The writing cannot be confirmed on the basis of the published photograph, but see Hallof, *JEA* 89 (2003), pl. 23.

[119] *REM* 0407, l. 2 without the adjunct *amni* only as *yeseboẖe:qore*.

[120] *RCK* III, pl. 23.

II. 13 CHRONOLOGICAL LINKS BETWEEN THE CUNEIFORM WORLD OF THE ANCIENT NEAR EAST AND ANCIENT EGYPT

Jörg Klinger

The multiple sources available for the reconstruction of the chronological background of ancient Near Eastern history are a major factor distinguishing these cultures from Egypt, where ultimately there is but one single historical thread. By contrast, Mesopotamia and the neighbouring regions offer a series of at least partially independent sources. There are admittedly important differences in the distribution of these sources over time and space such that phases with abundant material contrast with others which are less satisfying. For certain periods, there is simply insufficient material to draw any conclusions, regardless of the number of different threads available.

The middle of the second millennium is such a period, and this has led to the conundrum of three parallel chronological systems, each based on the Venus tablet recording year 6 of Ammisaduqa of Babylon.[1] These Venus observations seem to have offered the basis for the astronomical calculations, since this observational event repeats itself every 56/64 years, and thus the date means that the year 6 of Ammisaduqa can be set on a spectrum ranging from 1641 to 1577 BC. This fix point became a pivot upon which the various chronologies turned,[2]

[1] The texts are part of the omina series *Enūma Anu Enlil*; cf. esp. E. Reiner & D. Pingree, *Babylonian Planetary Omens. Part I: The Venus Tablet of Ammisaduqa* (Malibu, 1975). For an evaluation of the data, and the link with the lunar dates in particular, cf. also, V. G. Gurzadyan, "On the Astronomical Records and Babylonian Chronology", *Akkadica* 119–120 (2000), 180ff. and the literature listed there.

[2] Fundamental for establishing the chronological frameworks were the work of F. Cornelius, "Die Chronologie des Vorderen Orients im 2. Jahrtausend v. Chr.", *AfO* 17 (1954–56), 294ff., with a short survey of the state of the chronological discussion up to that time, and a plea for the "Low Chronology", along with B. Landsberger, "Assyrische Königsliste und 'Dunkles Zeitalter'", *JCS* 8 (1954), 31–45, 47–73, 106–133 and A. Goetze, "On the Chronology of the Second Millennium BC", *JCS* 11 (1957), 53–61, 63–73, favouring the "Middle Chronology", along with the response from F. Cornelius, "Chronology. Eine Erwiderung", *JCS* 12 (1958), 101–104. A standard table with dates for Mesopotamian rulers following the Middle Chronology was prepared by J. A. Brinkman for A. L. Oppenheim & E. Reiner, *Ancient Mesopotamia. Portrait of a Dead Civilization* (Chicago, 1977), 335–348.

with the later periods firmly anchored, and the earlier periods floating freely, the date for the fall of Babylon being 1595 (according to the Middle chronology) or 1531 BC (according to the Low chronology).[3] This point has now been lost since the observations are no longer viewed as reliable,[4] with the result that the long debate about the relative merits of the Middle or Low chronologies must now be abandoned, having become pointless as the various alternatives for an absolute date are no longer separated by intervals of 64 years. Instead, we now have a moving link separating a block of 500 years[5] from the later periods where the chronology is relatively reliable.[6]

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[3] The conquest of Babylon by Murshili I is an important event in the Hittite versions, but cannot be used chronologically. The Babylonian records indicate that it took place at the "time of Samsuditana"; Agum (II?) recovered of the plundered statues only 24 years later. The relevant references have been collected by G. Wilhelm, "Murshili", *RlA* VIII: 434–435; on the chronological evaluation, cf. A. Goetze, *JCS* 11, 65–73, and for the difficulties of the Kassite kings named Agum, cf. esp. J. A. Brinkman, *Materials and Studies for Kassite History* (Chicago, 1976), I, 95, 97.

[4] Cf. most recently, L. Sassmannshausen, "Babylonian Chronology of the 2nd Half of the 2nd Millennium BC", in: H. Hunger & R. Pruzsinszky, eds., *Mesopotamian Dark Age Revisited. Proceedings of an International Conference of SCIEM 2000, Vienna 8th–9th November 2002* (Vienna, 2004), 65.

On the evaluation of the dates, cf. P. J. Huber, "Astronomy and Ancient Chronology", *Akkadica* 119–120 (2000), 160–174, who still maintains that a statistical analysis of the possibly faulty dates is possible, and that the ensuing results which he considers to be compatible with a date for Ammisaduqa 1 are 1582 or 1516.

[5] The preservation of the very different strands from the beginning of the Ur III period (2111–2003 BC, Middle Chronology) to the end of the Old Babylonian period are so tightly woven that the relative chronology for the history of the first half of the second millennium can be viewed as certain; the prospective of either larger hiati or a significant reduction can be excluded. For the Ur III period, with its rich harvest of chronological data, cf. W. Sallaberger "Ur III-Zeit", in: W. Sallaberger & A. Westenholz, *Mesopotamien: Akkade-Zeit und Ur III-Zeit* (Fribourg, 1999), esp. 123ff.

[6] Explicitly: the use of a date 1531 or 1595 BC for the Hittite conquest of Babylon, which is certainly relevant for the beginning of Hittite history, is today a mere convention; limiting it to a period of 10–20 years is possible. Cf. the basic observation by C. Kühne, "Imperial Mittani: An Attempt at Historical Reconstruction", *SCCNH* 10 (1999), 203 n. 1, who in the meantime assumes a decade between "1550 and 1540 as a transitional decade for the end of the Old Babylonian Dynasty". Referring to the running dendrochronological analyses by P. I. Kuniholm (cf. also S. W. Manning, B. Kromer, P. I. Kuniholm & M. W. Newton, "Anatolian Tree Rings and a New Chronology for the East Mediterranean Bronze-Iron Ages", *Science* 294 (2001), 2532–35; M. W. Newton & P. I. Kuniholm, "A Dendrochronological Framework for the Assyrian Colony Period in Asia Minor", *Türkiye Bilimler Akademisi Arkeoloji Dergisi* 7 (2004), 165ff. and the current reports of the Aegean Dendrochronology Project at http://www.arts.cornell.edu/dendro/), he proposes 1541 BC +/– 37 years as a possible date for the Babylon campaign.

It was just a question of time until a new attempt would be made to revise the entire chronology of the period before the first millennium. The model proposed by Gasche et al. in 1998[7] thus gave momentum to a new and intense debate which endures up to the time of writing.[8] Whether a new chronological framework similar to that prevailing with the Middle Chronology will emerge remains to be seen. New sources are still not available, with the exception of the gradual clarification of the royal succession in the Middle Hittite period, which can at least offer some kind of orientation around the middle of the second millennium.[9] At present, the earlier chronological proposals are maintained as conventions.

The greatest lack in the cuneiform sources thus continues to be the lack of adequate data[10] combined with the absence of an overarching system of year names.[11]

In Assyria, the traditional principle of naming years and counting according to the holder of a certain office (*līmu*) was maintained, but the sequence of officials in the books of eponyms eliminated the need for naming the years. This system was already established in the first quarter of the second millennium, and became a standard dating method, as can be seen in the eponym dates in the thousands of Old Assyrian texts from the *kārum*-period in Anatolia, and as is confirmed by the recent discovery of two tablets with *līmu* lists.[12] With the overlap between

[7] Gasche et al., *Dating*.

[8] Thus a recent attempt at an ultra-long chronology, cf. C. Eder, "Assyrische Distanzangaben und die absolute Chronologie Vorderasiens", *AoF* 31 (2004), 191–236.

[9] There are a whole series of astronomical observations completely independent of these which are highly significant and could contribute to gaining a higher resolution for the DeltaT (Deceleration of the rotation of the earth) factor which is so important and difficult in these calculations. In addition, there are specific cases where chronologically absolute dates can be checked or controlled using calculable dates. Here, we will merely refer to the detailed investigations by Stephenson, *Eclipses*. Specifically relevant for the Ancient Near East are chapters 4–7; cf. also below Locher, chapter III. 9.

[10] Cf. A. Ungnad, "Datenlisten", *RlA* II: 131–194 and Oppenheim (n. 2), 145–146.

[11] An illustration of selection of such year names can be found in translation in W.H.Ph. Römer, in: *TUAT* I, Fasc. 4, (Gütersloh, 1984), 337ff. For the year names, cf., above all, the relevant article by A. Ungnad, "Eponymen", *RlA* II: 412–457, and the compilation of the literature with possible additions in Gasche et al., *Dating*, 47 n. 200 and the short survey in Sallaberger (n. 5), 231–237.

[12] On the discovery of the lists and an initial evaluation of their chronological relevance, cf. K. R. Veenhof, "Old Assyrian Chronology", *Akkadica* 119–120 (2000), 137–150; these are now published: K. R. Veenhof, *The Old Assyrian List of Year Eponyms from Karum Kanish and its Chronological Implications*, Atatürk Supreme Council for Culture, Language and History—Publications of the Turkish Historical Society Serial VI—No. 64 (Ankara, 2003. The discovery of additional texts of this genre has since been announced.

these lists and the eponym chronicle from Mari, a period of almost exactly 200 years is not absolutely precisely dated in relative terms. This allows the end of *kārum* Kanesh II to be placed into a relative chronological context, and this permits further deductions about the overall chronological framework of the whole period. If we allow that the eponym chronicle ends with the death of Shamshi-Adad I, and the final 20 or more names in the *kārum*-texts cannot be identified, the end of *kārum* II will have been roughly in year 11 or 12 of Shamshi-Adad I.[13] This means that the restoration of a few more fragmentary entries in the Assyrian king-lists contributes significantly to the second major source for the establishment of an Ancient Near Eastern chronology.[14] Yet here too, it must be conceded that the later periods are better documented and more reliable, than both the earlier era, and the neighbouring regions. These lists are the spine of all dates stretching back to the 12th century, complemented by eponym-lists (generally complete fort he first half of the first millennium),[15] and themselves anchored absolutely with a solar eclipse, dated to 15 June 763 BC, recorded in the eponym-lists.[16] The general compatibility of the versions of the Assyrian king-lists thus leaves only small margins in dating the reigns of the Assyrian kings back to the 12th century.[17]

[13] For details, cf. Veenhof, *Akkadica* 119–120, esp. 139 and Veenhof (n. 12), 61–62. Veenhof dates the accession of Shamshi-Adad to the year 1833 BC, on the basis of the Middle Chronology. Important is also his observation that the *Distanzangaben* of the later Assyrian tradition relate to Irishum I and Shamshi-Adad I, meaning that these are therefore probably realistic, effectively negating the hypothesis that the *Distanzangaben* are not chronologically relevant. Following the traditional Middle Chronology, Veenhof specifies the following Old Assyrian dates: the accession of Irishum I in 1974 BC and the death of Shamshi-Adad I in 1776 BC.

[14] On the king-lists, cf. above all, the article by A. K. Grayson, "Königslisten und Chroniken. B. Akkadisch", *RlA* VI: 86–135; by comparison, the Sumerian lists are less useful, cf. D. O. Edzard, "Königslisten und Chroniken. A. Sumerisch. 1.5. Historischer Wert", *RlA* VI: 81–82.

[15] Fundamental for the Neo-Assyrian eponyms is A. Millard, *The Eponyms of the Assyrian Empire 910–612 BC* (Helsinki, 1994); for the Middle Assyrian period, H. Freydank, *Beiträge zur mittelassyrischen Chronologie und Geschichte* (Berlin, 1991) is indispensable. For the more recent eponym lists, cf. the literature cited by Gasche et al., *Dating*, 47 n. 204.

[16] The course of this total solar eclipse and other data is easily accessible on Espenak's NASA eclipse website: http://sunearth.gsfc.nasa.gov/eclipse/. For the specifications of this solar eclipse, cf. also Stephenson, *Eclipses*, 126–127.

[17] For this, cf. J. Boese & G. Wilhelm, "*Aššur-dān* I., *Ninurta-Apil-Ekur* und die mittelassyrische Chronologie", *WZKM* 71 (1979), 19ff.; the error margin for Ashshur-resha-ishi I (1132–1115 BC) towards the end of the 12th century is +/− 2 years.

In comparison with the Assyrian sources, the Babylonian material is far poorer. The Babylonians did indeed move relatively rapidly to a more elegant and relatively more accessible means of dating, namely simply counting the years sequentially according to the king's reign, which became the norm as early as the first half of the 14th century.[18] However, there is a comparative dearth of written sources,[19] so that the Babylonian chronology must be established by synchronisms with Assyrian history, where works such as the synchronic history are important—if partial[20]—witnesses.

The general situation is more or less comparable in all of the other areas, as a consistent sequential system of dates was not used anywhere, or is at least not preserved. This means that any attempt to establish a precise chronology for the history of the ancient Near East must rely initially on the Assyrian data, and only then on that of their neighbours, and their predecessors. Once these relative chronologies have been established, the second step is to identify the best possible synchronisms with the Assyrian chronology. Due to the multitude of sources, and especially the diplomatic correspondence of certain periods, it is possible to establish not merely one-to-one links, but actually to weave a fabric of relations which can actually be established without any internal contradictions.

Arriving at absolute dates depends upon a very different and diverse set of conditions. For the first millennium, people and events can be dated with near precision, as the uncertainty is highly constrained. For the earlier periods, some closed blocks can be isolated in which the relative chronology is certain, but anchoring these to the absolute dating of the first millennium leaves a considerable margin of error. There is a significant contrast with respect to the precise chronological synchronisations between Mesopotamia and Egypt for the first and second millennia. For the first millennium BC, where the Assyrian data is reliable and precise, the correlation difficulties lie with Egypt, whereas before this, the reverse is true.

[18] Cf. Brinkman (n. 3), 402f.; probably during the reign of Kadashman-Enlil II.

[19] A. K. Grayson, "Königslisten und Chroniken. 3. Kings Lists", *RlA* VI: 89ff. offers a survey of the Babylonian sources; along with the fragments of a synchronic list, 121ff.

[20] This covers the period from the middle of the 2nd millennium through Adad-nerari III in the 8th century; edited by A. K. Grayson, *Assyrian and Babylonian Chronicles* (Locust Valley, 1975).

Despite the millennia during which these civilisations existed, documents confirming direct contacts and exchange between Mesopotamia and it neighbours on the one hand, and Egypt on the other, are rather rare and restricted to certain historical phases. Although one can assume that at all times there will have been people who were travelling back and forth or trading between these lands, this has left virtually no trace in the sources. We only have access to major state activities—diplomatic contacts or military engagements—which were generally exceptional.[21] The lucky find of the Amarna archive appears to be a period of particularly intensive contacts, but may actually have been repeated at very different times. The multi-facetted diplomatic archives from Hattusha can serve as a hint that *cum grano salis* the same continuity of epistolary exchange may have taken place with other powers, and even in times which appear to us quite obscure.[22]

Despite such obstacles, there is a general consensus among scholars on the basic framework of the chronological framework which can be established using the basis provided by the Assyrian records, including also the reduction of ca. one decade in the Assyrian chronology proposed some time ago.[23] Another constraint is the revised model proposed by H. Gasche et al., which would result in a significant reduction even with respect to the Low chronology. Affecting the ancient Near East up to the middle of the second millennium BC, it touches a period for which the Assyrian sources do not provide complete cover.[24]

[21] The seemingly comprehensive documentation in the Mari archives does not reveal one single direct link to Egypt, cf. A. Malamat, *Mari and The Early Israelite Experience* (Oxford, 1989), 61f. c. n. 125. An informative survey on the geographical horizon of international relations in the Amorite period will be found in B. Lafont, "Relations intenationales, alliances et diplomatie au temps des royaumes amorrites", *Amurru* 2 (2001), 213ff., where Egypt likewise fails to appear.

[22] The first fragment of a cuneiform letter, presumably from the diplomatic correspondence of Ramesses II, was found in 2003 in the excavations at Pi-Ramesses in the Delta, cf. E. B. Pusch & S. Jakob, "Der Zipfel des diplomatischen Archivs Ramses' II.", *Ä&L* 13 (2003), 145–153.

[23] Fundamental is the contribution by Boese & Wilhelm (n. 17) as well as the further and generally positive reception with the literature to be found by Freydank (n. 15), 11 n. 3. Freydank (n. 15; 34) confirms that although no definitive conclusions can be drawn from what is hitherto known from the Middle Assyrian eponyms, he tends to assign the two kings relatively short reigns.

[24] The arguments in Gasche et al., *Dating*, are supported not only by philological historical sources, but fundamentally based on archaeological criteria. For a critical evaluation, cf. G. Colbow, "Syrian Chronology in the Old and Early Middle Babylonian Periods", *Akkadica* 119–120 (2000), 103–116.

For the period from the end of the 14th century, the dates of this new proposal do not differ significantly from those used hitherto, as a comparison between the Boese/Wilhelm shortened Assyrian chronology and the "ultra-low chronology" produced by Gasche et al. shows.[25] The only point up for discussion between Tiglathpileser I (1114–1076 BC) and Ashshur-nerari II (1414–1408 BC) is the reign of Ashshur-dan I, and his predecessor Ninurta-apil-Ekur, which has led to the proposed reduction of Assyrian chronology by 10 years, as mentioned.[26] The interpretation of the expression *tuppishu* is less significant, since it concerns only the insertion of an additional year.[27]

The further back in Assyrian history one goes, the greater the divergences and the greater the room for differing chronological assumptions so that Gasche et al. favour bringing the end of the First Dynasty of Babylon down to 1499, rather than 1531 or 1595 BC. At present, from the philological standpoint, only the statements of the periodic intervals (*Distanzangaben*) can serve as control mechanisms. Unfortunately, there is no consensus on their value and chronological relevance. Gasche et al. logically argue that the temporal intervals preserved as *Distanzangaben* are either incorrect or they try to provide a specific interpretation for the relevant interval.[28] An inscription of Shalmaneser I concerning his

[25] Compare the table in Boese & Wilhelm (n. 17), 38 with that of Gasche et al., *Dating*, 62. The work by Freydank (n. 15; 188–189), offers another survey of the reigns of the Middle Assyrian kings following the standard dates and the shortened Assyrian chronology. In the following, we follow the shortened chronology offered by Boese & Wilhelm, as this provides better data when compared with Egyptian chronology.

[26] For the details, cf. Boese & Wilhelm (n. 17), 23ff.; the shortening was not adopted by Gasche et al., *Dating*, 51 c. n. 223, probably because the collation of the relevant passage (cf. J. A. Brinkman, *Or* 42 [1973], 300 n. 15 and particularly on this, cf. Boese & Wilhelm (n. 17; 24) in the "Nassouhi-Kinglist" (= Copy A of King List No. 9, J. A. Brinkman, *RlA* VI: 101ff.; the passage is in III 41f., *RlA* VI: 111) was interpreted as a confirmation although the reading—"46"—there, which Gasche et al., *Dating*, 51, used their table is described as "expressively optimistic", cited from Boese/Wilhelm and not the actual "26+[x]" originally published by Brinkman, and cited by him again in the *RlA* VI: 111.

[27] Cf. the references cited by J. A. Brinkman, *RlA* VI: 112, who translates "his tablet", for Ninurta-tukulti-Ashshur and Mutakkil-Nusku; W.v. Soden, *AHw*, 1304b, assumes that the corresponding entries are "short reigns of less than a year", while Freydank (n. 15), 33–34 assumes either a form of coregency or a distinction of the actual exercise of power during the formally still existing reign of Ashshur-dan I, whereby the corresponding entries in the king lists do not record an independent reigns. Gasche et al., *Dating*, 53–54, likewise reckon with 0 years.

[28] Cf. Gasche et al., *Dating*, 57: "Our analysis of the *Distanzangaben* makes it apparent that no firm chronological conclusions can be drawn from them." This statement only applies to the model they propose.

reconstruction of the Ekursagkurkurra specifies a period of 580 years separated his reign from that of Shamshi-Adad I. Understood in this fashion, this would be an obstacle to a major chronological change.[29] The authors therefore propose that the passage should be interpreted as meaning that the number "580" does not refer to the interval between Shamshi-Adad I and the author Shalmaneser I, but also that the preceding period of 159 years between the construction of the temple by Irishum I and its first renovation by Shamshi-Adad should be subtracted from the figure,[30] and therefore the 580 years thus represent the entire period between the construction and reconstruction. This necessarily leads to a substantial reduction in the chronology, a century and a half in fact.[31]

It must be stated that this significant reduction not only entails suggesting a reduction of the length of the Assyrian period of almost 200 years,[32] whereby roughly a quarter of a century will have passed since the end of the Third Dynasty of Ur,[33] but also that a close link between the dynasty ruling in Yamkhad probably allows a link between the Old Hittite Period and the earlier periods,[34] and that this simply cannot be reduced at will.[35] The links in the chronological system of the first half

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[29] Simply rejecting the Distanzangaben completely is apparently not appropriate as can be surmised from the analysis of the dates by Boese & Wilhelm (n. 17), 29ff.; indeed Veenhof's demonstration, based on the recently discovered Old Assyrian *līmu*-Lists, is highly significant (cf. Veenhof n. 12; 139, c. n. 7).

[30] It is precisely this source, the reliability of which can be assumed; cf. the last note.

[31] For an analysis of the data in a diametrically opposed sense, cf. now Eder (n. 8), 194ff.

[32] Veenhof (n. 12), 139f. indicates that the period from Irishum I, year 1, to the death of Shamshi-Adad I was exactly 199 years, resulting from the recently discovered *līmu*-Lists allowing an overlap with the eponym-lists from Mari.

[33] Cf. Veenhof (n. 12), 141.

[34] Based on the genealogy beginning with Samsuiluna of Babylon, who was at least partially contemporary with Abba'el and over the immediate descendents Yarim-Lim II—Niqmepa—Yarim-Lim III—Hammurapi, who will have a contemporary of Hattushili I or Murshili I.

[35] In addition there is a solar eclipse listed in the Mari chronicle for the year after the birth of Shamshi-Adad I, for which C. Michel & P. Rocher, "La chronologie du II^e millénaire revue à l'ombre d'une éclipse de soleil," *JEOL* 35–36 (1997–2000), esp. 124 proposed that the most likely match would be the eclipse of 1795 BC. Taking the *Distanzangabe* separating Shalmaneser I and Shamshi-Adad I, it follows that 1234 BC + 580 years = 1814 BC, placing the accession at the age of 18, resulting in a birth around 1832–33 which matches quite well with the solar eclipse of 24 June 1832 BC. When revising her position to take account of the recent dedrochronological information, C. Michel ("Nouvelles données pour la chronologie", *N.A.B.U.* 2002/1, 17–18)

of the second millennium between Assyria and Babylon, with the death of the Assyrian king Shamshi-Adad I during the second decade of the reign of the Babylonian king Hammurabi[36] ultimately allows the synchronisation of Hittite history with Mesopotamian history through the campaign of Murshili I leading to the end of the First Dynasty of Babylon in year 31 of Samsuditana. Dating this event to the year 1499 BC creates major problems for Hittite history.[37]

The question of the form of the Assyrian calendar is less serious than the differing evaluation of the *Distanzangaben*, but nevertheless important. The issue is whether it depended upon lunar months and whether or not intercalary months were used to match the solar year,[38] and thus whether or not calculations lead to a difference in the number of years in the chronology with respect to solar years. Fortunately, there is evidence favouring the use of solar years in Assyria during the second millennium and not just later.[39]

For the present purpose, these points do not have any significant impact since there are no direct synchronisms before the Amarna

shifted her support to the identification of this eclipse. It is difficult to believe that the dates from such different sources could merely coincidentally converge into such a coherent chronology. It follows that a shortening of the chronology as proposed by Gasche et al., is excluded. Instead, this seems to suggest a chronological model slightly higher than the "Low Chronology" and slightly lower than the "Middle Chronology". Michel (above) proposes shortening the "Middle Chronology" by 15 years, and some such variant would be entirely compatible with the Hittite royal succession, and particularly that of the Middle Hittite period.

36 This applies although the precise year of the death of Shamshi-Adad I is still discussed, as it may have been in year 12, 13 or 17 of the reign of Hammurabi; cf. Gasche et al., *Dating*, 64 and the literature cited in n. 265, as well as D. Charpin, in: D. Charpin, D. O. Edzard & M. Stol, *Mesopotamien: Die Altbabylonische Zeit* (Fribourg: OBO 160/4, 2004), 155–156 (n. 713), 193.

37 As is the new suggestion by Gasche et al., *Dating*, 64f., 77ff.; they did not attempt to integrate the difficulties of Hittite history between Murshili I and Tutkhaliya I (cf. Gasche et al., *Dating*, note 92). G. Beckman, "Hittite Chronology", *Akkadica* 119–120 (2000), 19ff. discussed precisely these issues at length and came to the conclusion "that the Anatolian evidence does not favour the suggested downward revision of the date of the fall of Babylon".

38 The practice is known since the Ur III period, and letters from the Old Babylonian period record an intercalary month based on royal decrees, but the continuous usage of some rules cannot be documented, at least partially because of the lack of sources. In Assyria, the regular use of calibrating by using the lunar calendar is only known from the 1st millennium, cf. H. Hunger & E. Reiner, "A Scheme for Intercalary Months from Babylonia", *WZKM* 67 (1975), 21ff. and H. Hunger, "Kalender", *RlA* V: 297–303.

39 Cf. the negative position taken by Veenhof (n. 12) 147, joining the arguments in Gasche et al., *Dating*.

period.[40] We can thus use the dates for the Assyrian kings as proposed by Boese/Wilhelm as the basis for the presentation of the synchronisms with Egyptian history.

The earliest contacts are recorded in the Amarna letters[41] which refer to earlier events, and specifically to the relations between Egypt and the Hurrian Mittani state, the most important major power in Western Asia in the 15th century. After intense diplomatic contacts under Amenhotep II a dynastic marriage was arranged during the reigns of Thutmose IV and Artatama (I), which should be dated to the first decades of the 14th century according to the Egyptian chronology. The tradition was maintained by Shuttarna II and Amenhotep III who married a Mittani princess in his year 10, and later a daughter of Tushratta, who had since become ruler. In Shuppiluliuma I of Hatti, Tushratta met a dangerous foe in the first decade of the second half of the 14th century. In light of the complete absence of any original Hurrian or Mittani state sources, not much more chronological information can be gleaned from the information of the Amarna letters.[42]

It is only with the 14th century[43] letters of the Assyrian king Ashshur-Uballit I to Amenhotep IV (EA 15 and 16) that a real synchronism can be won from the Amarna letters.[44] There would appear to be considerable room for debate since the Assyrian ruled for more than 30

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[40] The situation is different when considering the indirect relations which can be adduced from the interpretation of historical developments, as in, e.g., the question of whether the Hittite advance into northern Syria took place during a period of Mittani dominance or was in fact favoured by Egyptian advances; cf. J. Klinger, "Synchronismen in der Epoche vor Suppiluliuma I.—einige Bemerkungen zur Chronologie der mittelhethitischen Geschichte", in: O. Carruba, Cl. Mora & M. Giorgeri, eds., *Atti del II. Congresso Internazionale di Hittitologia* (Pavia: Studia Mediterranea 9, 1995), 235ff. Ultimately, such reconstructions depend upon the chronology selected, and thus easily feed into circular logic.

[41] Cf. J. A. Knudtzon, *Die El-Amarna Tafeln* (Leipzig, 1915) or W. L. Moran, *The Amarna Letters* (Baltimore, 1992).

[42] For a summary, cf. Kühne (n. 6), and St. de Martino, "Il regno hurrita di Mittani: profilo storico-politico", in: *La Parola del Passato* LV (2000), 25ff. and with particular reference to the Amarna correspondence, B. M. Bryan, "The Egyptian Perspective on Mittani", in: R. Cohen & R. Westbrook, eds., *Amarna Diplomacy. The Beginnings of International Relations* (Baltimore, 2000), 71–84 and P. Artzi, "The Diplomatic Service in Action: The Mittani File", idem, 205–211.

[43] Assyria will have freed itself from Mittani hegemony shortly before the end of the 15th century, which allowed Ashshur-bel-nisheshu (1409–1400 BC) to renew the alliance with Babylon, under Kara-indash.

[44] Mentioning an exchange of letters between Ashshur-nadin-aḫḫe II and Amenhotep III.

years,[45] but the contents of the first letter place it relatively near the start of his reign (1353 BC).[46] Thereafter follows a gap of several centuries in the historical record of direct contacts between the two powers.

For further links between the cuneiform-using states and Egypt, we can turn to Babylonian and Hittite sources. As preserved, the Amarna correspondence documents contacts over several generations—as in letters between the Babylonian king Kadashman-Enlil I and Amenhotep III, and their successors Burnaburiash II and Amenhotep IV where the Egyptian must have come to the throne during the reign of the second Babylonian king, as the latter is in touch with both of these pharaohs. The preserved letters contain indications that of the earlier Kassite kings, Kara-indash had contact with Thutmose IV, and Kurigalzu I with Amenhotep III.[47] Since the reigns of the Kassite Kings before Kadashman-Enlil are unknown these vague hints appear unpromising, yet one can actually create a chronological framework since we know that Kara-indash reigned at the same time as the Assyrian king Ashshur-bel-nishu (1407–1399 BC), which puts some limits for the not particularly long reign of Thutmose IV.[48]

The sources are more precise for Kadashman-Enlil I[49] and Burnaburiash II,[50] as the reign of the latter is known, and the synchronic

[45] In the absence of detailed information about the temporal relationship between the predecessors of Eriba-Adad I and Amenhotep III and his successor Amenhotep IV, we can only deduce that the exchange must have taken place around 1381 BC.

[46] Beckerath, *Chronologie*, 61 places this "shortly after his accession to the throne", which he dates to 1355 BC, and thus according to his chronology, dating the accession of Amenhotep IV to the end of 1351 BC, allowing an indirect synchronism, as EA 15 does not name the pharaoh. Quite apart from this, there is sufficient time in the reign of Amenhotep IV for the second letter to have been addressed to him, despite the uncertainties with respect to the reading of the name.

[47] Above all, Burnaburiash II to Amenhotep IV in EA 10, 8ff. The details of the Babylonian succession add to the uncertainty, but do not have any significant impact in this context, cf. Brinkman (n. 3), 169 and J. A. Brinkman, "Istanbul A. 1998, Middle Babylonian Chronology, and the Statistics of the Nippur Archives", *ZA* 73 (1983), 67–74. For the beginnings of the correspondence with Babylon, cf. C. Kühne, *Die Chronologie der internationalen Korrespondenz von El-Amarna* (Neukirchen-Vlyn: AOAT 17, 1973), 52f. n. 244.

[48] Recently, J. A. Brinkman, "Nazi-Marruttaš", *RlA* 9: 190b, placed Kadashman-Harbe I ca. 1405, and Kurigalzu I ca. 1390 BC; cf. also the chronological table by Sassmannshausen (n. 4), esp. 67–69.

[49] The assumption of a 15-year reign is not, however, compelling, as Brinkman (n. 3), 142f. c. n. 27 specifically stresses.

[50] Following Brinkman, this would be 1359–33 BC, as recently in RlA 9: 190b, i.e., the same dates as those in his table published in Oppenheim & Reiner (n. 2), 338. It should be noted that Brinkman (n. 3), 32 n. 89 already observed the proposed dates

history links the end of his reign with the Assyrian chronology.[51] As he actually corresponded with Amenhotep III,[52] but the exchange of letters only began after his 30th year,[53] the entire reign of Amenhotep IV would thus parallel that of Burnaburiash II, who must have reigned until the accession to the throne of the successor of this pharaoh, and thus to the year 1323 BC according to the shortened chronology.[54] His accession to office must then have taken place in 1349 BC, when Amenhotep III would still have been reigning according to the synchronism of the Amarna letters. However, some of the numbers remain uncertain due to factors which have not yet been eliminated in the reigns of the Kassite rulers, and thus the figures cannot be taken as absolute limits. Discrepancies with Egyptian dates[55] can easily be explained as lying in the Babylonian sources. We must therefore confirm that the known synchronisms between Egypt and Babylon cannot provide and exact chronological fix points due to the imprecision inherent in the frame of reference, or in the uncertainties in the chronological framework itself, although they do place some further limits on the range of variation.[56]

According to sources in internal Hittite history, contacts between the Egyptian and Hittite kings were so intense that a treaty already clarified relations between the two in the 15th century. Fragments of this accord—known as the Kurushtama-treaty—are preserved,[57] and its significance

ultimately depend upon the reigns of the Assyrian kings, and that aside from a few uncertain factors mentioned there that any reduction must be accompanied by a corresponding change there; however, there still remains a margin of +/– 5 years.

[51] For the details cf. Brinkman (n. 3), 418ff.

[52] This is the most probable interpretation of EA 6 according to the collation by Kühne (n. 47), 129 c. n. 642.

[53] Cf. most recently, Beckerath, *Chronologie*, 66.

[54] Cf. also Brinkman (n. 3), 6 n. 1.

[55] The reduction in the Babylonian chronology in this case would stand in contradiction to the assumed accession of Amenhotep IV ca. 1351/50 BC, as Burnaburiash would only have ascended to the throne in the following year, and thus a synchronism with the older of the two pharaohs would be excluded, although precisely this is fact reliably attested. The margin of uncertainty in this phase remains the +/– 5 years mentioned.

[56] A fragmentary economic text found during the excavations at Assur in 2001 (Ass. 2001.D–2217) documents a direct synchronism between Melishipak of Babylon (ca. 1186–1172 BC following J. A. Brinkman, "Meli-shipak", *RlA* VIII: 52) and Ninurta-apil-Ekur of Assyria (for whom, cf. E. Cancik-Kirschbaum, *AoF* 26 [1999], 215ff.); cf. the preliminary report by E. Frahm, *MDOG* 134 (2002), 75.

[57] The few sources available are assembled under CTH 134. KUB 40.28 (= 134.C) is a fragmentary text preserved in a Middle Hittite copy. A. Ünal's (RlA VI: 373)

recorded later in the context of the Deeds of Shuppiluliuma I,[58] yet the hints do not suffice to provide a precise context.[59] According to the sources, the only possible Hittite ruler would be Tutkhaliya I,[60] as otherwise the Hittite history of this period was dominated by internal conflict with a correspondingly weak foreign policy, and thus actions in Syria cannot be expected.[61] The pharaoh who was party to this treaty can only be traced through the Hittite sources,[62] and for the moment these are inadequate to define the period when Tutkhaliya I reigned,[63] beyond specifying that it might have been around the third

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speculation that these Kurushtama-fragments could merely be part of the Egyptian correspondence of Shuppiluliuma I is thus impossible.

[58] DŠ Frag. 28 (cf. H. G. Güterbock, "The Deeds of Shuppiluliuma as Told by his Son Murshili II", *JCS* 10 (1956), 41–68, 75–98, 107ff.). A great many details are still unresolved, and thus it is impossible to state with certainty that it merely a question of a single treaty and not possibly a series of international accords; for this issue, cf. D. Sürenhagen, *Paritätische Staatsverträge aus hethitischer Sicht* (Pavia: Studia Mediterranea, 1985), 22ff. Equally uncertain is the exact placement of those fragments 29 and 30 discussed by H. G. Güterbock of DŠ, which both mention Egypt.

[59] Likewise belonging to the Middle Hittite period in the draught letter in Hittite, where neither the name of the Hittite king nor that of the Pharaoh to whom it was addressed is preserved. Given its date, the text can be assigned to the period before Shuppiluliuma I. As preserved, it can be deduced that this letter followed another exchange and the Hittite kings complains of a deterioration in relations which has now been resolved. Tutkhaliya I is one possible author, but this remains pure speculation in the absence of further information. For the text itself, cf. E. Edel, "Bo 92/129, ein neues Brieffragment in hethitischer Sprache der Korrespondenz zwischen Ägypten und Hatti", ZA 86 (1996), 114–7; since published as KBo 31.40.

[60] There is still some doubt about the number of kings named Tutkhaliya who reigned in the period immediately before Shuppiluliuma I. In this case I assume the sequence: Tutkhalija I—Arnuwanda I—Tutkhalija II—Shuppiluliuma I; cf. also similarly, H. Klengel, *Geschichte des Hethitischen Reiches* (Leiden: HdO I. 34, 1999), 103.

[61] Cf. the literature cited by Klengel (n. 60), 106f. (on source [A8]) c.n. 93f., who likewise stresses this identification is purely hypothetical.

[62] W. Helck, *Die Beziehungen Ägyptens zu Vorderasien im 3. und 2. Jahrtausend v. Chr.* (Wiesbaden: ÄA 5, 1971²), 166 suggested either Thutmose III or Amenhotep II, but did not exclude Thutmose I. In any case, it should be evident that the events detailed here are incompatible with the proposed date of 1499 BC for the campaign of Murshili I to Babylon, as they took place more than a century later, and thus well into the 14th century. The synchronism between Idrimi and Murshili I recently proposed by W. van Soldt, "Syrian Chronology in the Old and Early Middle Babylonian Period", *Akkadica* 119–120 (2000), 111 or between Idrimi and Zidanta I, by Kühne (n. 6), 214 n. 67 are incompatible with the chronological scheme proposed here, as is the attempt to make a historical link between Murshili I and Thutmose I; for this, cf. F. Zeeb, "The History of Alalaḫ as a Testcase for an Ultrashort Chronology of the Mid-2nd Millennium BCE", in: Hunger & Pruzsinszky (n. 4), 91f.

[63] The proposed reigns of some 20–25 years each for the three kings before Shuppiluliuma I in the chronological table of the exhibition catalogue, *Die Hethiter und ihr Reich* (Stuttgart, 2002), 312ff. are largely hypothetical or rely upon an historical

quarter of the 15th century.[64] We can, however, define the number of generations separating Tutkhaliya I and Shuppiluliuma I, since the latter was the son of the former's grandson (Tutkhaliya II).[65] Given the difficulties of counting generations, the internal between them should be more than 50 and less than 100 years.[66]

Similarly difficult is precisely delimiting the reign of Shuppiluliuma I,[67] whose long reign will have stretched from that of Amenhotep III until perhaps the reign of Aya.[68] It is only certain that he was in direct contact with Amenhotep IV. Whether he was also in touch with his father depends upon identifying the pharaoh concealed behind the apparently unreliable cuneiform transcription Hurija in EA 41 written by Shuppiluliuma I.[69] Any further attempts to establish a more exact

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image dependent upon the short chronology, which simply cannot be assumed given the very limited historical information at our disposal; this also necessarily applies to the proposed accession date ca. 1420 BC for Tutkhalija I.

[64] Dating Thutmose I to the first decade of the 15th century means that he should be most probably understood as a contemporary of Tutkhaliya I, as the now reliable reconstruction of the royal succession in the Middle Hittite period tends to bring Tutkhaliya I closer to Shuppiluliuma I than was the case earlier. On the other hand, the land donation documents definitely attest that allowance must be made for more generations between the reign of Tutkhaliya I and the end of the Old Hittite period (or the beginning of the Middle Hittite period, with the reign of Telpinu as the threshold) than had been appreciated earlier.

[65] A detailed discussion of the Middle Hittite king lists is impossible here for obvious reasons.

[66] For a detailed account of the specific problem as concerns Hittite history, cf. G. Wilhelm, "Generation Count in Hittite Chronology", in: Hunger & Pruzsinszky (n. 4), 71–79; Eder (n. 8), 224ff. likewise reveals the great differences possible in the interpretation of the material.

[67] Cf. Klengel (n. 60), 147: "The precise moment of the accession cannot be fixed;" the various possibilities were discussed by G. Wilhelm & J. Boese, "Absolute Chronologie und die hethitische Geschichte des 15. und 14. Jahrhunderts v. Chr.", in: Aström, *Acts*, 73–117, esp. 76ff. themselves pleading for a much later accession, possibly even after the accession of Amenhotep IV, whose reign they set at 1343–1322 or 1318 BC.

[68] Most recently discussed in detail by Wilhelm & Boese (n. 67) suggesting a significant reduction in the length of the reign rather than the 40 years traditionally accepted. This has not been accepted as the sources simply do not allow for a definitive conclusion, but the issue must remain open. Cf. also G. Wilhelm, "Probleme der hethitischen Chronologie", *OLZ* 86 (1991), cols. 471ff. The issue was most recently discussed by J. Freu, "La chronologie du règne de Suppiluliuma: Essai de mise au point," in: P. Taracha, ed., *Silva Anatolica* (Warsaw, 2002 = Fs Popko), 87ff. He opposes a drastic reduction in the reign of Shuppiluliuma I, and assumes a 30–40 year reign—dependent upon a coregency between Amenhotep III and Amenhotep IV (esp. 107).

[69] A decision depends largely upon the author's historical interpretation, but there is a tendency to exclude Amenhotep III, probably following Wilhelm & Boese (n. 67), 96ff.: W. L. Moran (n. 41), 114f. and Klengel (n. 60), 139 (on source [A 10]).

chronological ordering of the historic events thus depends upon the interpretation of the Dakhamunza-affair, that is of who made the astonishing offer of a dynastic marriage to the unbelieving Hittite king—and a generally accepted solution has still not emerged.[70] The widow's name is not preserved in the Hittite version, and the throne name, Nibḫururii̯a, of the dead pharaoh is recorded in the cuneiform version of the Deeds of Shuppiluliuma I, but this was only written down on the orders of his son Murshili II. The question is therefore identifying the name of the pharaoh whose widow sent the proposal to Shuppiluliuma I.[71] Can the cuneiform Nib at the beginning of the name be only an Egyptian nb, or is a nf(r) also possible?[72] According to my judgement, in the absence of a sufficient quantity of cuneiform attestations which could offer a corresponding orthographic principle to which one could refer, the linguistic and orthographic arguments simply cannot be resolved.[73] Quite apart from this, there is no means of knowing whether a Hittite copyist faced with an unfamiliar name written with what was at that time the quite alien sign /nap/ may not have chosen to divide the signs syllabically as NI-IB. Given that the quite adequate transcription of Nb-ḫprw-Rʿ as [m]Ni-ib-ḫu-ru-ri-ja (KUB 34.24+ rev. IV 18)[74] is in principle correct, we can assume that the throne name of

[70] The literature here is almost endless, we cannot go into detail here, as for some time now the Hittite sources have simply not shed any new light on the matter. The most recent discussion of the question is that of M. Gabolde, *D'Akhenaton à Toutânkhamon* (Lyon, 1998), to which we refer here. M. Gabolde offers a summary of his thesis: "Das Ende der Amarnazeit", in: A. Grimm & S. Schoske, eds., *Das Geheimnis des goldenen Sarges* (Munich, 2001), 9–42. Basing himself on new epigraphic finds and new interpretations of previously neglected (or differently interpreted) materials, he identifies the widow as Meritaten who replaced Nefertiti near the end of the reign of Amenhotep IV, and when he died, turned to Shuppiluliuma I. This compels him to identify Nibḫururii̯ as Nfr-ḫprw-Rʿ Amenhotep IV, and to assign the letter EA 9 to him. For this, cf. M. Eaton-Krauss & R. Krauss, [review of Gabolde], *BiOr* 58 (2001), col. 96 and furthermore W. J. Murnane, *OLZ* 96 (2001), 11ff.

[71] All of the preserved texts relevant to the remarkable episode were assembled by Th.P.J. van den Hout, "Der Falke und das Kücken", *ZA* 84 (1994), 60–88, esp. 61f.

[72] For a long time, a reading of *nb*- favoured Tutʿankhamun, but this changed when Krauss, *Amarnazeit*, 9ff. argued in favour of *nfr*-, and thus for Amenhotep IV.

[73] Definitely favouring the first possibility is most recently T. Bryce, "The Death of Niphururiya and its Aftermath", *JEA* 76 (1990), 97–105, whereby he shares what can be viewed as the Hittitological consensus, as argued by Wilhelm & Boese (n. 67), 100f.; cf. also van den Hout (n. 71), 84f.; E. Edel, *Die ägyptisch-hethitische Korrespondenz aus Boghazköï in babylonischer und hethitischer Sprache II* (Opladen, 1994), 23 n. 3; and G. Meyer, *GM* 126 (1992), 87–92.

[74] In contrast KBo 5.6 obv. III 7 has [m]Pí-ip-ḫu-ru-ri-ja-a; an error of PÍ for NE?

Tutʿankhamun was intended, as alternative readings are difficult to justify, and actually rely upon a further series of assumptions. Assuming this identification of the pharaoh, we can project a series of dates for the end of the reign of Shuppiluliuma I. After the victorious campaign with which the Hittites responded to the murder of the Hittite prince Zannanza,[75] Egyptian prisoners brought the plague to Hattusha, and Shuppiluliuma I himself died shortly thereafter, possibly due to the epidemic.[76] The death of Shuppiluliuma I—and the accession to the throne of his two sons Arnuwanda II and Murshili II—can thus be tied to the Egyptian chronology, and Shuppiluliuma I can only have lived for 2–4 years after the death of Tutʿankhamun. On the other hand, this also enables us to verify the veracity of the interpretations due to the solar eclipse dating to the reign of Murshili II, whose reign can thus be given absolute dates. This means that the two systems must be formed in a fashion which allows an accession to the throne for Murshili II in 1321,[77] since the death of Shuppiluliuma I must be limited to either 1323–1322 or 1326–1325 BC.[78] In contrast to the first mentioned contacts between Egypt and the Hittites, the Dakhamunzu episode might—with all due caution—provide a date relevant to the entire chronological discussion, allowing a link for the two independent chronological systems.

For the decades after the Amarna period, the sources on Hittite-Egyptian relations vary widely. Although the age of Murshili II is among the most productive in terms of overall Hittite historiography, there would appear to be few real opening for the study of relations with Egypt. In terms of their political calculations, the Hittites did not feel

[75] The thesis argued by M. Gabolde, that Zannanza actually briefly reigned under the throne name of Smenkhkare is not probable; cf. the sceptical judgement of Eaton-Krauss & Krauss, *BiOr* 58 (2001), col. 96.

[76] As noted, what can be won from the Hittite sources was assembled by van den Hout (n. 71), 85ff.

[77] Cf. the detailed discussion by Wilhelm & Boese (n. 67), 105ff. Nevertheless, the assumption that the solar eclipse took place in the spring (ibid, pp. 106f.) is not obligatory as it actually relies upon what is actually a rather dubious restoration of KUB 14.4 IV 25f. by E. Forrer, but cf. A. Götze, KlF 1, 1930, 405. Therefore, nothing stands in the way of the total eclipse of 24 June 1312 BC.

[78] Favouring the latter date is van den Hout (n. 71), 88, who arrives at 17 years from the death of Nibkhururija = Tutʿankhamun to the solar omen (with 6 years of the reign of Shuppiluliumas I + 1 year of Arnuwanda II + 10 years of the reign of Murshili II), and thus assumes a death in 1325 BC; his calculations are, however, based on the solar eclipse of 13 April 1308 BC.

either challenged or constrained by Egypt. This only changed significantly when Ramesses II came to the Egyptian throne, changing the political constellation during the reign of Muwatalli II, the son and successor of Murshili II.[79] The temporary removal of the Hittite capital from Hattusha to Tarkhuntashsha had significant repercussions for the textual record such that the reign of Muwatalli is badly documented. The lack of relevant documents can be interpreted as meaning that some of the documentation was not returned when Hattusha became the capital again under Muwatalli's successor. This may be the reason why that period of increasing contact which culminated in the battle of Kadesh, so heavily stressed in the Egyptian tradition, appears to be marginal in the Hittite tradition. A further consequence of our limited understanding of this period in Hittite history is that at the pinnacle of the Hittite-Egyptian conflict, the battle of Kadesh in year 5 of Ramesses II, we can only specify that his opponent was Muwatalli II. The treaty signed in the wake of the conflict in year 21 of Ramesses II was negotiated and sealed by Hattushili III.[80] Nor are there any sources from the Hittite capital Hattusha which can allow this decisive event to be dated, despite the abundance of letters from both kingdoms dating to before and after the signing of the treaty, and despite the wealth of details we have for the internal history of the Hittites during this important age.

Nevertheless, the Egyptian sources do allow some key dates, throwing light on the transfer of power from Urkhi-Teshshup (= Murshili III), whose reign was ended by the usurpation of Hattushili III during these 16 years. It is unclear how long after year 5 of Ramesses II, that

[79] The end of the reign of Murshili II can only be approximately delimited since for the later years of the reign the preservation of the annals is significantly worse than for the phase up to ca. regnal year 20. Nevertheless, we can be relatively certain that Murshili remained on the throne for some three decades. A. Ünal, "Muwatalli II", *RlA* VIII: 524–527, esp. 524 assigns Muwatalli II a reign of "ca. 1290–1265 BC", but postulates that he either fell (or was mortally wounded) at the battle of Kadesh, and therefore dying then or shortly thereafter, yet he likewise dates this to ca. 1274 BC (ibid., 527)—which would be nearly a decade earlier. The source used by A. Ünal in this connection, linking the death of the Hittite king with this campaign (citing ABoT 57 obv. 8 is probably an error, as the passage, and as KBo 4.10+ obv. 40'ff. clearly confirms, relates to the removal of the capital and not to the death of the king), refer only to the death without placing this in any identifiable context.

[80] For the text of the treaty, cf. E. Edel, *Der Vertrag zwischen Ramses II. von Ägypten und Hattushili III. von Hatti* (Berlin: WVDOG 95, 1997) prefaced (p. 1) with a short account of the prehistory of the treaty.

Urkhi-Teshshup, the direct and legitimate heir of Muwatalli II, came to the throne as Murshili III, and how long he reigned.[81] It was during his reign that the removal of the capital was cancelled, for reasons beyond our knowledge. The sources are silent about Murshili's other activities,[82] and direct synchronisms with other kings cannot be proved.[83] Nevertheless, a draught letter from the reign of Hattushili III to the Assyrian king—which could be either Adad-nerari I or Shalmaneser I[84]—mentions contacts between his predecessor and the Assyrian recipient of the royal letter, and the correspondence between Hattushili III and Ramesses II suggests that Murshili III was also in touch with this Egyptian king, although these cannot be documented either. Just how dependent the interpretations of the fragmentary letters are upon the assumed historical background is illustrated in exemplary fashion by the fragmentary draught of a letter (KUB 23.102). It is generally assumed that the intended recipient was Adad-nerari I, given the clear hints at a very tense relationship between Assur and Hatti, and the Hittite king dismisses any equality between the two. This suggests that the letter should be dated to a period of increasing Assyrian power, but a concrete

[81] The immediate circumstances of the usurpation and its possibly not entirely unanimous acceptance have been frequently discussed, but the partial character of the sources available mean that the details still remain obscure. In view of the partial descriptions by one of the actors, namely the usurper Hattushili III, it is significant that there is a seal impression naming Muwatalli and the later king Murshili with his given name, which could potentially imply a relatively early attempt at securing the succession; for a detailed survey of the entire situation, cf. most recently, Ph. Houwink ten Cate, "Urḫi-Tessub revisited", *BiOr* 51 (1994), 239ff.

[82] Summarized by Klengel (n. 60), 226ff.

[83] The reason for this may be that the lack of information forthcoming from the fragmentary sources available, e.g., the diplomatic correspondence cannot generally be assigned to or related to Murshili III. On the general tenor of the later sources on Murshili III, cf. also the literature cited Klengel (n. 60), 257 n. 501.

[84] This is the letter KBo 1.14; cf. A. Hagenbuchner, *Die Korrespondenz der Hethiter. 2. Teil: Die Briefe mit Transkription, Übersetzung und Kommentar* (Heidelberg: THeth 16, 1989), No. 195 (obv. 15f.) and A. Harrak, *Assyria and Hanigalbat* (Hildesheim: TSO 4, 1987), 69ff., who pleads for Adad-nerari I while A. Ünal, *Hattushili* III., Teil I, *Hattushili bis zu seiner Thronbesteigung*, Bd 1: *Historischer Abriß* (Heidelberg: THeth 3, 1974), 6, favours Shalmaneser I. By contrast, following M. B. Rowton, "The Background of the Treaty between Ramesses II and Hattushili III", *JCS* 13 (1959), 1–11, or M. B. Rowton, "The Material from Western Asia and the Chronology of the Nineteenth Dynasty", *JNES* 25 (1966), 249–258, the only possible candidate would be Adad-nerari I. This proposal is, however, based exclusively on an interpretation of the material based upon the content, and a corresponding reconstruction of the historical context—which is by means the only possibility. The reference to Murshili III while avoiding the throne name Urḫi-Teššup only permits us to conclude that one of his successors wrote the letter.

synchronism does not follow. It is not irrelevant that we can hardly expect to find draught letters from the reign of Muwatalli II in the archives of Hattusha,[85] as this favours attributing the letter to Murshili III. An uncertain but possible synchronism of the latter with Adad-nerari I would follow, leading to a throne change before 1264 BC (the death of Adad-nerari I). Were one to date the letter to Hattushili III, the length of the reign of Murshili would shrink further.[86] It is certain that Murshili III came to the throne after 1275, and remained on it until perhaps 1263 BC, but a shorter reign is more probable. The (at least) "7 years" during which Hattushili III allegedly remained loyal[87] according to his "Apology" need not be taken as a real measure of time; although possible, it cannot be independently verified. This means that the accession to the throne of Hattushili III cannot be determined with precision. Neither the Egyptian chronology nor Egyptian sources, including the correspondence of Ramesses II, offer additional aid.[88] As the synchronism with Shalmaneser I can only offer a date after 1263, then the letter KBo 1.14 becomes interesting. If this letter is from Hattushili III and addressed to Adad-nerari I, then—and only then—would we be able to place the beginning of the reign of Hattushili III in the period after 1268 and before 1264/3 BC.[89]

Although generally viewed as a letter from Tutkhaliya IV to Tukulti-Ninurta I, which would provide another hook for the end of the reign

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[85] Following Hagenbuchner (n. 84), 263; for a discussion of the correct placing of the text, cf. Klengel (n. 60), 204 c. n. 304.

[86] A. Hagenbuchner, THeth 16, reads in obv. 16 [A-BI A-BI-J]A-ma! A-BI-JA-ja "my father and [m]y [grandfather], however", yet the position of the *-ma* would be unusual, aside from the fact that a collation with the photo suggests that the sign should rather be read as BA, so that the point of departure should be A-BA A-BI-JA-ja, and thus exactly that expression used in KBo 6.28 obv. 16 by Hattushili III with reference to his grandfather Shuppiluliuma I, during whose reign, Assyria first attempted to free itself from Mittani hegemony. By contrast, in his 9th regnal years his successor Murshili II was forced to ward off an assault by Adad-nerari I which reached as far as the eastern bank of the Euphrates at Carchemish; the Assyrians managed to take Taide, Wasashatta's capital, as mentioned in KUB 23.102 obv. I 1. Regardless, Urḫi-Teššup was the grandson of Murshili II.

[87] Cf. H. Otten, *Die Apologie Hattusilis III. Das Bild der Überlieferung* (Mainz: StBoT 24, 1981), 20f.: "And given the estimation of my brother, I refrained from any actions, and was obedient for 7 years" (rev. III 62; on the verbal form in question, cf. Most recently J. Tischler, *HEG* III, 421).

[88] The peace treaty with Hattushili III was sealed in regnal year 21 (i.e., 21/XI/1259 BC) of Ramesses II, and was followed by a widely publicised dynastic marriage in regnal year 34.

[89] Cf. Boese & Wilhelm (n. 67), 36 n. 65.

of Hattushili III, the fragmentary letter KUB 26.70 cannot really shed light on the matter. We must bear in mind that in terms of content, this would suggest an exchange of letters between Urkhi-Teshshup/Murshili III and Shalmaneser I, but this can nevertheless have taken place after the usurpation by Hattushili III.[90] Even using the fragments of the diplomatic correspondence with Assur, we simply lack the necessary cornerstones required to date the reigns of the Hittite kings of the 13th century.[91] Hattushili III and Tutkhaliya IV reigned during the times of Shalmaneser I, but we cannot tell whether his 30 year reign began before the fall of Murshili III, or only thereafter, although the latter possibility is more probable. Tutkhaliya IV definitely reigned in Hatti when Tukulti-Ninurta I came to the throne in Assur. Whether he was still in office when Shuppiluliuma II became king cannot be confirmed as nothing can delimit the length of the reign of the last king known from the archives of Hattusha, according to which the Hittite empire ended sometime shortly after 1200 BC.[92] Nor are there any hints at contacts to any of the rapidly disappearing kings during the uneasy period after the murder of Tukulti-Ninurta, i.e., Ashshur-nadin-apli to Ninurta-apil-ekur and Ashshur-dan II.

The correspondence with the Babylonian kings is ever worse preserved than that with the Assyrians, who only allow a few additional points in a more precise temporal organization of the Hittite kings of

[90] For this, cf. primarily, S. Heinhold-Krahmer, "Zu Salmanassars I. Eroberungen im Hurritergebiet", *AfO* 35 (1988), 94 n. 181, and now Beckerath, *Chronologie NR*, 26 c. n. 144 (following up on Hornung's earlier work).

[91] Little of value can be gained from the fragments (KBo 28.59–63) of a Middle Assyrian royal letter sent to Hattusha, but one can still appreciate that the subject is the behaviour of Šagarakti-Šuriaš, of Babylon which suggests that one can assume that it was composed between the later part of the reign of Shalmaneser I and the beginning of that of Tukulti-Ninurta I; for such a reading, cf. W. von Soden, "Weitere mittelassyrische Briefbruchstücke aus Hattusas", in: E. Neu & Ch. Rüster, eds., *Documentum Asiae minoris antiquae* (Mainz, Fs Otten, 1988), 346. The reference to Tutkhaliya does suggest dating the correspondence to his reign, yet this does not allow its chronological limits to be defined any further. Finally, it is unclear just what the reference to a period of "100 years" signifies (KBo 28.61 rev. 9').

[92] The date from Emar for year 2 of the Babylonian king Melishipak—which corresponds to the year 1187 BC, cannot be used for the abandonment of the Hittite capital Hattusha as it is by no means certain that the "Sea Peoples" were responsible for the end of Emar, cf. now Klengel (n. 60), 318 c. n. 35. The destruction of Ugarit thus remains the terminus ante quem, but this only allows an extension into the reign of Siptah, i.e., until 1197 BC (cf. the literature cited by Klengel (n. 60), 318, no. 33, as well as Ras Shamra-Ougarit XI, [1995] with the text published by S. Lackenbacher, RSO XI, 77ff.).

the 13th century, allowing for some synchronisms supported by the sources. There is a letter from Kadashman-Turgu I to Hattushili III (KUB 3.71),[93] and these two would appear to have signed a treaty with each other, as indicated by a draught letter prepared at the Hittite court (KBo 1.10+9), but apparently during the reign of Kadashman-Enlil II and to be assigned to Hattushili III who mentions the accession of the young Babylonian ruler in the text.[94] The change of power in the Kassite royal house is set at about 1264/63 BC, but from the Kadesh treaty it is clear that Hattushili III came to the throne before the year 21 of the reign of Ramesses II. Reducing this date by a decade, following the Assyrian regnal years, would appear to be difficult, but there nevertheless remains the margin of uncertainty, amounting to almost a decade for the Babylonian kings, to which repeated reference has been made, and which cannot be further reduced for the moment.

[93] For this, the best discussion remains E. Edel, *Ägyptische Ärzte und ägyptische Medizin am hethitischen Königshof. Neue Funde von Keilschriftbriefen Ramses' II aus Boğazköy* (Opladen, 1976), 123ff.

[94] Above we mentioned the indirect references relating to Šagarakti-Šuriaš, from the later correspondence with Tukulti-ninurta I. Whether this Babylonian king's reign was contemporary with that of Tutkhaliya IV (the presumed recipient of the letter) is uncertain, as the relationship between the time the letter was written and the references to Tukulti-ninurta I who conquered Babylon during the reign of Kashtiliash IV (1232–1225 BC) is not clear. It depends upon whether the events mentioned in the text took place at that time, or whether the letter mentioned events which had taken place at some point in the past.

PART III

ABSOLUTE CHRONOLOGY

III. 1 RADIOCARBON DATING AND EGYPTIAN CHRONOLOGY*

Sturt W. Manning

1. *Introduction: History of Field*

In the beginning, the historical chronology of Egypt was held to offer a test for the utility of the radiocarbon dating method; measurements were thus run on several ancient Egyptian samples and the ability to achieve ages relatively close to the historical age demonstrated that radiocarbon dating worked in approximate terms (or was not 'beyond reasonable credence').[1] Egyptian samples thus comprised part of the original 'curve of knowns' published in Arnold and Libby[2] to show that the radiocarbon method worked, approximately, over the last several thousand years.

Over the next few decades a number of radiocarbon ages were obtained on Egyptian samples. Egyptian chronology continued to be considered as the known age, and radiocarbon was being compared—tested. Radiocarbon technology through the 1960s was not capable of delivering ages of sufficient accuracy or precision to be of actual utility to Egyptologists.[3] In 1970 Säve-Söderbergh and Olsson published a well thought out critical analysis of radiocarbon dates from Egypt.[4] They highlighted problems of poor association between samples and presumed historical context (or age), of contamination, and of the need

* The final text of this paper was submitted 19 August 2003. The paper employs the *then* standard IntCal98 radiocarbon calibration dataset. A new IntCal04 dataset has since been published in early 2005 (*Radiocarbon* vol. 46(3), 2004). Use of the new dataset would make only small and fairly insignificant changes to the figures and discussions in this paper. For a comparison of the two calibration curves for the period 500–3500 BC, see Figure III. 1.6 at the end of this paper.

[1] W. F. Libby, "Archaeology and radiocarbon dating", *Radiocarbon* 22 (1980), 1017–1020.

[2] J. R. Arnold & W. F. Libby, "Age determinations by radiocarbon content: checks with samples of known age", *Science* 110 (1949), 678–680.

[3] H. S. Smith, "Egypt and C14 dating", *Antiquity* 38 (1964), 32–37.

[4] T. Säve-Söderbergh & I. U. Olsson, "C14 dating and Egyptian chronology", in: I. U. Olsson, ed., *Radiocarbon variations and absolute chronology* (Stockholm, 1970), 501–511.

to achieve replication and inter-laboratory checks. But Säve-Söderbergh and Olsson also noted the uncertainties attending the historical dates, especially those prior to the second millennium BC.

Overall, Egyptian chronology contributed positively to the development of radiocarbon dating in the earlier decades: the apparent discrepancies observed between the radiocarbon age of some third millennium BC samples (mainly from Egypt) versus their 'known' age led to focussed interest in the investigation of such anomalies.[5] Such work, using especially known age tree-rings, led to the realisation that the relationship between radiocarbon and solar (calendar) years was *neither* equivalent nor fixed.[6] The development of increasingly accurate and precise records of such secular variation in natural radiocarbon levels became the dominant theme in radiocarbon dating for the next generation; already by the late 1960s to early 1970s calibration curves existed to convert radiocarbon years to calendar years back to beyond 5000 BC.[7]

The advent of calibrated radiocarbon dating, which had the effect of making many prehistoric contexts in Europe older than previously believed, had a radical impact in prehistoric archaeology—in particular leading to the replacement of the previous 'diffusionist' models.[8] Calibration also meant that the radiocarbon ages for Egyptian samples needed reconsideration, and a series of papers quickly addressed the radiocarbon dates from Egypt in the light of the initial proposals for an approximate calibration curve.[9] However, although the calibrated ages made general sense, the radiocarbon dates continued to be of

[5] W. F. Libby, "Accuracy of radiocarbon dates", *Antiquity* 37 (1963), 7–12.

[6] H. deVries, "Variation in the concentration of radiocarbon with time and location on Earth", *Koninklijke Nederlandse Akademie van Wetenschappen* (Series B) 61 (1958), 94–102.—H. E. Suess, "Secular variations of the cosmic-ray-produced carbon 14 in the atmosphere and their interpretations", *Journal of Geophysical Research* 70 (1965), 5937–5952.

[7] E.g. H. E. Suess, "Bristlecone-pine calibration of radiocarbon time 5200 BC to present", in: Olsson (n. 4), 303–312.

[8] C. Renfrew, "The tree-ring calibration of radiocarbon: an archaeological evaluation", *PPS* 36 (1970), 280–311.—Idem, *Before civilisation. The radiocarbon revolution and prehistoric Europe* (London, 1973).

[9] I. E. S. Edwards, "Absolute dating from Egyptian records and comparison with carbon-14 dating", *Philosophical Transactions of the Royal Society of London A* 269 (1970), 11–18.—R. M. Derricourt, "Radiocarbon chronology for Egypt and North Africa", *JNES* 30 (1971), 271–292.—R. M. Clark & C. Renfrew, "Tree-ring calibration of radiocarbon dates and the chronology of ancient Egypt", *Nature* 243 (1973), 265–270.—R. D. Long, "Ancient Egyptian chronology, radiocarbon dating and calibration", *ZÄS* 103 (1976), 30–48.—R. M. Clark, "Bristlecone pine and ancient Egypt: a re-appraisal", *Archaeometry* 20 (1978), 5–17.

neither the accuracy nor precision to be of any real use to Egyptology; furthermore, the routine radiocarbon technology of the time required large sample sizes that were often problematic or impossible in terms of acquisition from archaeological excavations or from monuments or museums.

Over the subsequent quarter of a century radiocarbon dating has dramatically improved in terms of accuracy, precision, and sample size requirements.[10] In tandem, the natural and anthropogenic cycles and variations in atmospheric radiocarbon levels have become quantified in considerable detail.[11] The necessity of careful archaeological and other analysis to ascertain the security of association between the sample to be dated and the context for which a date is required is now fully appreciated (seminal paper by Waterbolk 1971).[12] Programmes of inter-laboratory checking have greatly improved general standards in the field.[13] New technologies like accelerator mass spectrometry (AMS) permit dating of tiny samples,[14] and several routine radiocarbon laboratories refined accuracy and precision to what is termed 'high-precision' level. Today the leading high-precision laboratories can demonstrate both good correspondence between measured ages and known real tree-ring ages, and good agreement between the laboratories, within the presently possible precision margins of c.2‰—that is within c.10–20 radiocarbon years for the periods discussed in this paper.[15] The key

[10] R. E. Taylor, Radiocarbon dating, in: R. E. Taylor & M. J. Aitken, eds., *Chronometric dating in archaeology* (New York, 1997), 65–96.

[11] T. F. Braziunas, I. E. Fung & M. Stuiver, "The pre-industrial atmospheric $^{14}CO_2$ latitudinal gradient as related to exchanges among atmospheric, oceanic, and terrestrial reservoirs", *Global Biochemical Cycles* 9 (1995), 565–584.—M. Stuiver & T. F. Braziunas, "Anthropogenic and solar components of hemispheric ^{14}C", *GRL* 25 (1998), 329–332.—I. Levin & V. Hesshaimer, "Radiocarbon—a unique tracer of global carbon cycle dynamics", *Radiocarbon* 42 (2000), 69–80.

[12] H. T. Waterbolk, "Working with radiocarbon dates", *PPS* 37 (1971), 15–33.

[13] E.g. International Study Group, "An inter-laboratory comparison of radiocarbon measurements in tree-rings", *Nature* 298 (1982), 619–623.—E. M. Scott, A. Long & R. S. Kra, eds., "Proceedings of the international workshop on intercomparison of radiocarbon laboratories", *Radiocarbon* 32(3) (1990), 253–397. And further international inter-comparison exercises since.

[14] H. E. Gove, "The history of AMS, its advantages over decay counting: applications and prospects", in: R. E. Taylor, A. Long & R. S. Kra, eds., *Radiocarbon after four decades: an interdisciplinary perspective* (New York, 1992), 214–229.

[15] E.g. M. Stuiver, P. J. Reimer, E. Bard, J. W. Beck, G. S. Burr, K. A. Hughen, B. Kromer, G. McCormac, J. van der Plicht & M. Spurk, "INTCAL98 radiocarbon age calibration, 24,000–0 cal BP", *Radiocarbon* 40 (1998), 1041–1083.—B. Kromer, S. W. Manning, P. I. Kuniholm, M. W. Newton, M. Spurk & I. Levin, "Regional $^{14}CO_2$ offsets in the troposphere: magnitude, mechanisms, and consequences", *Science* 294

outcome of the latter development was the creation in the mid-1980s of a high-precision calibration of the radiocarbon timescale for the BC period.[16]

Shaw[17] quickly tried out high-precision calibration for existing Egyptian samples using the Irish Oak data of Pearson *et al.*[18] He found the calibrated ages to be in general agreement with the historical chronology, but did not see them as able to offer a useful alternative. Shaw was uncomfortable with the 'wiggles' in the calibration curve, and the situation where a given radiocarbon age could yield two or more calendar age ranges. It was Hassan and Robinson[19] who finally brought methodological sophistication and chronometric hygiene to bear for Egyptian radiocarbon dates. They reanalysed the corpus of radiocarbon data from Egypt against the 1986 high-precision calibration curve. They found that with suitable samples radiocarbon often could yield results compatible with the historical chronology;[20] and they highlighted the ability of radiocarbon to date directly a whole range of Egyptian contexts not closely tied into written records and the chronology of the pharaohs—a hint of the future real relevance of radiocarbon to (especially non-élite) Egyptian archaeology and its chronology. But they also concluded that the existing corpus of radiocarbon data as of 1987 was not, with a few exceptions, fully satisfactory—they instead looked forward to better measurements in the future and *then* the fulfilment of the promise of radiocarbon dating.[21]

(2001), 2529–2532.—F. G. McCormac, A. G. Hogg, T. G. F. Higham, J. Lynch-Stieglitz, W. S. Broecker, M. G. L. Baillie, J. Palmer, L. Xiong, J. R. Pilcher, D. Brown & S. T. Hoper, "Temporal variation in the interhemispheric ^{14}C offset", *GRL* 25 (1998), 1321–1324.

[16] G. W. Pearson, J. R. Pilcher & M. G. L. Baillie, "High precision ^{14}C measurements of Irish oaks to show the natural ^{14}C variations from 200BC to 4000BC", *Radiocarbon* 25 (1983), 179–186.—G. W. Pearson, & M. Stuiver, "High-precision calibration of the radiocarbon time scale", 500–2500 BC, *Radiocarbon* 28 (1986), 839–862.—M. Stuiver & G. W. Pearson, "High-precision calibration of the radiocarbon time scale, AD 1950–500 BC", *Radiocarbon* 28 (1986), 805–838.

[17] I. M. Shaw, "Egyptian chronology and the Irish Oak calibration", *JNES* 44 (1985), 295–317.

[18] Pearson *et al.* (n. 16).

[19] F. A. Hassan & S. W. Robinson, "High Precision radiocarbon chronometry of ancient Egypt, and comparisons with Nubia, Palestine and Mesopotamia", *Antiquity* 61 (1987), 119–135.

[20] See also B. Weninger, "Theoretical radiocarbon discrepancies", in: D. A. Hardy & A. C. Renfrew, eds., *Thera and the Aegean world* III. 3: *Chronology* (London, 1990), 216–231.—B. Weninger, *Studien zur dendrochronologischen Kalibration von archäologischen ^{14}C-Daten* (Bonn, 1997).

[21] Cf. (n. 19) at p. 129.

But sadly there have been at best limited attempts to provide such better quality radiocarbon data for the periods after the Archaic—where increasingly good data exist.[22] Instead, publications by leading Egyptian chronological specialists concerned with the 3rd through earlier 1st millennia BC in the late 1990s through 2003 largely dismissed or ignored radiocarbon evidence;[23] with Kitchen stating that '"science" cannot solve the intricate problems of detailed Egyptian successions, and the cross-links with the neighbouring Near East; texts alone can do that'.[24] Such scholars cannot see any use for radiocarbon dating versus the believed-in dating accuracy and precision available from textual evidence. Ironically, the potential modern relevance of radiocarbon to Egyptology has been brought to the fore by a set of publications in the 1990s, which sought to question and reject the standard chronological synthesis and instead to propose a radically different (lower) Egyptian chronology for the second and earlier first millennia BC.[25] These writers appreciated that radiocarbon dating offered an independent check on their claims—they thus sought to dismiss or downplay radiocarbon dating evidence.[26] In reality, however, radiocarbon evidence from the east Mediterranean indicated the reverse: that the range of the standard chronology was correct.[27] Radiocarbon perhaps had a use after all for Egyptian chronology.

[22] J. Görsdorf, G. Dreyer & U. Hartung, "^{14}C dating results of the Archaic Royal Necropolis Umm el-Qaab at Abydos", *MDAIK* 54 (1998), 169–175.—S. H. Savage, "AMS ^{14}Carbon Dates from the Predynastic Egyptian Cemetery, N7000, at Naga-ed-Dêr", *JAS* 25 (1998), 235–249. Cf. A. R. Millard & T. A. H. Wilkinson, "Comment on 'AMS radiocarbon dates from the Predynastic Egyptian Cemetery, N7000, at Naga-ed-Dêr' by S. H. Savage", *JAS* 26 (1999), 339–341.—S. H. Savage, "Towards an AMS radiocarbon chronology of Predynastic Egyptian ceramics", *Radiocarbon* 43 (2001), 1255–1277.

[23] E.g. Beckerath, *Chronologie*, 55–56.

[24] K. A. Kitchen, "Ancient Egyptian chronology for Aegeanists", *Mediterranean Archaeology and Archaeometry* 2.2 (2002), 5–12 at p. 11.

[25] P. James, I. J. Thorpe, N. Kokkinos, R. Morkot & J. Frankish, *Centuries of darkness* (London, 1991).—D. M. Rohl, *A test of time. 1: The Bible—from myth to History* (London, 1995).

[26] James *et al.* (n. 25), 321–325.—P. James, N. Kokkinos & I. J. Thorpe, "Mediterranean chronology in crisis", in: M. S. Balmuth & R. H. Tykot, *Sardinian and Aegean chronology: towards the resolution of relative and absolute dating in the Mediterranean* (Oxford: Studies in Sardinian Archaeology V, 1998), 29–43.—Rohl (n. 25), 384–387.

[27] E.g. S. W. Manning & B. Weninger, "A light in the dark: archaeological wiggle matching and the absolute chronology of the close of the Aegean Late Bronze Age", *Antiquity* 66 (1992), 636–663.—S. W. Manning, B. Weninger, A. K. South, B. Kling, P. I. Kuniholm, J. D. Muhly, S. Hadjisavvas, D. A. Sewell & G. Cadogan, "Absolute age range of the Late Cypriot IIC period on Cyprus", *Antiquity* 75 (2001), 328–340.

2. *Radiocarbon Dating and the Historical Timescale*

The problem, historically, is that earlier radiocarbon dating offered at best large possible date ranges for any given measurement and these dates thus seemed an order of magnitude less accurate or precise than those available from the historical chronology of Egypt (the point made by von Beckerath).[28] And, as the review of Weinstein showed,[29] up until the early 1980s it is true that radiocarbon simply lacked the ability to supply the precision required in calendar years to be relevant to the existing, quite refined, historical chronology for the ancient Near East. But the advent of high-precision calibration curves from the mid-1980s, and increased accuracy and precision for standard radiocarbon dates, dramatically changed the situation. It was now possible to approach the precision of the historical chronology, and radiocarbon dating could thus offer an independent chronology free from the assumptions and step-wise logic transfers inherent in the existing chronological synthesis for Egypt and, there from, for the whole east Mediterranean.[30]

Recent developments emphasise this position. Following the first internationally recommended high-precision calibration curves of 1986, a second internationally recommended extension, refinement, and revision was made available in 1998[31]—and another (IntCal04) has been published while this text was in press.[32] Radiocarbon calibration datasets from tree-ring records from the east Mediterranean[33] have confirmed the local relevance of the standard northern hemisphere calibration for most periods (such work has inaddition identified some intervals of possible regional/temporal variations for further study linked to key periods of short-term solar irradiance minima and climate change issues).[34] The

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[28] Beckerath, *Chronologie*, 56.

[29] J. M. Weinstein, "Radiocarbon dating in the southern Levant", *Radiocarbon* 26 (1984), 297–366.

[30] H. J. Bruins & W. G. Mook, "The need for a calibrated radiocarbon chronology of Near Eastern archaeology", *Radiocarbon* 31 (1989), 1019–1029.

[31] Stuiver *et al.* (n. 15).

[32] P. J. Reimer et al., "Radiocarbon calibration from 0–26 cal kyr BP", *Radiocarbon* 46, 3 (2004), 1029–1058.

[33] Kromer *et al.* (n. 15).—S. W. Manning, B. Kromer, P. I. Kuniholm & M. W. Newton, "Anatolian tree-rings and a new chronology for the east Mediterranean Bronze-Iron Ages", *Science* 294 (2001), 2532–2535.—S. W. Manning, M. Barbetti, B. Kromer, P. I. Kuniholm, I. Levin, M. W. Newton & P. J. Reimer, "No systematic early bias to Mediterranean ^{14}C ages: radiocarbon measurements from tree-ring and air samples provide tight limits to age offsets", *Radiocarbon* 44(3) (2002), 739–754.

[34] See B. Kromer, M. Korfmann & P. Jablonka, "Heidelberg radiocarbon dates for

development and application of stratified archaeological 'wiggle-matching' techniques have in turn allowed the exploitation of both (i) refined archaeological knowledge (stratigraphy) *and* (ii) the now refined and specific history of past natural atmospheric levels of radiocarbon entailed in these calibration curves in order to yield accurate and highly precise calendar age ranges for sets of seriated samples.[35] Radiocarbon dating has thus moved from a resolution of century-scale at best, to now being capable of decadal scale resolution. Radiocarbon can thus now have relevance at the 'historical' timescale.

This does not mean that everything is now simple and clear; there remains plenty of scope for ambiguities and inconsistencies—as illustrated in several of the papers in the recent Bruins *et al.* volume in *Radiocarbon*.[36] In particular, without selection of directly relevant samples from primary contexts (e.g. short- to shorter-lived samples from secure and specific archaeological contexts relevant to the archaeological event/phase for which a date is sought), and then proper pre-treatment, and accurate and precise measurement in the laboratory, nothing useful will be gained. Old wood is clearly a major problem with some Egyptian samples[37] (see Section 4 below). The need for quality control at radiocarbon laboratories in terms of known-age blind checks is widely appreciated these days. Attention is increasingly moving now to the consideration of the integrity of the sample itself as offering only the

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Troia I to VIII and Kumtepe", in: G. A. Wagner, E. Pernicka & H.-P. Uerpmann, eds., *Troia and the Troad: scientific approaches* (Berlin, 2003), 52–53.

[35] E.g. Manning and Weninger (n. 27).—C. E. Buck, J. A. Christen & G. N. James, "BCal: an on-line Bayesian radiocarbon calibration tool", *Internet Archaeology* 7 (1999), [http://intarch.ac.uk/journal/issue7/buck/]—C. E. Buck, C. D. Litton & S. J. Shennan, "A case study in combining radiocarbon and archaeological information: the early Bronze-Age settlement of St. Veit-Klinglberg, Land Salzburg, Austria", *Germania* 72 (1994), 427–447.—B. Weninger, "Stratified ^{14}C dates and ceramic chronologies: case studies for the Early Bronze Age at Troy (Turkey) and Ezero (Bulgaria)", *Radiocarbon* 37 (1995), 443–456.—C. Bronk Ramsey, "Radiocarbon calibration and analysis of stratigraphy: the OxCal program", *Radiocarbon* 37 (1995), 425–430.—J. A. Christen & C. D. Litton, "A Bayesian approach to wiggle-matching", *JAS* 22 (1995), 719–725.—J. A. Zeidler, C. E. Buck & C. D. Litton, "The integration of archaeological phase information and radiocarbon results from the Jama River Valley, Ecuador: a Bayesian approach", *Latin American Antiquity* 9 (1998), 160–179.—C. Bronk Ramsey, J. van der Plicht & B. Weninger, "'Wiggle matching' radiocarbon dates", *Radiocarbon* 43 (2001), 381–389.

[36] H. J. Bruins *et al.*, "Near East Chronology: archaeology and environment", *Radiocarbon* 43 (2001), 1147–1390.

[37] M. Lehner, S. Nakhla, Z. Hawass, G. Bonani, W. Wölfli, H. Haas, R. Wenke, J. Nolan, W. Wetterstrom, "Dating the pyramids", *Archaeology* 52(5) (1999), 26–33.

age of interest. Thus does the sample remain intact with only the radiocarbon age from the time the sample was exchanging with the atmosphere, or have contaminating materials become included? And have there been processes of post-depositional diagenesis at work which are relevant? The need to investigate bone samples to ensure good collagen preservation is already appreciated and various strategies have been adopted.[38] Although typically not likely to be a significant issue in general, the need to confirm removal of potentially contaminating humic material from archaeological wood/charcoal/seed samples should be a focus of further work.[39]

3. *Radiocarbon and Egypt: An Example of Historically Relevant Data*

Integrated archaeological and radiocarbon analyses in other parts of the world carried out over the last decade have shown that, with high quality sampling and analysis, it is possible and practical to resolve chronology accurately and precisely down to the near-historical timescale. Although there has not yet been a significant body of work for Egypt after the Archaic period (e.g. refs. Section 1 above), it is important to appreciate that radiocarbon is now capable of offering relevant and *independent* dating for the OK through TIP. What is needed are modern research programmes. To demonstrate that radiocarbon can potentially provide useful data which can either confirm and test historical chronology (where available), or can provide near-historical level dating for those many other archaeological contexts in Egypt for which secure historical dates are not available, I review one example. The lack of my ability to note several good examples reflects the history of the field (cf. previous sections), and the failure so far to exploit radiocarbon where it could be most useful.

[38] R. E. M. Hedges, "Bone diagenesis: an overview of processes", *Archaeometry* 44 (2002), 319–328.—G. J. Van Klinken, "Bone collagen quality indicators for palaeodietary and radiocarbon measurements", *JAS* 26 (1999), 687–695.

[39] See already D. Alon, G. Mintz, I. Cohen, S. Weiner & E. Boaretto, "The use of Raman spectroscopy to monitor the removal of humic substances from charcoal: quality control for ^{14}C dating of charcoal", *Radiocarbon* 44 (2002), 1–11.

Tell el-Amarna

Among existing radiocarbon dates from Egypt, one suite demands attention.[40] These are five dates on a range of materials (bone, horn, skin, wood and charcoal) collected specifically and carefully for a high-quality programme of radiocarbon dating[41] from modern excavations at Tell el-Amarna, the short-lived capital of Egypt for most of Akhenaten's reign, founded in his 5th regnal year or ca. 1350/1346 BC.[42] The city's relative chronology is based on seventeen successive vintages documented in its epigraphical record, fourteen of Akhenaten himself (years 4 to 17), and three belonging to his successors.[43] The city was deserted before the delivery of an eighteenth vintage. The specific context of the samples taken for radiocarbon analysis was a midden probably deposited early within the site's history and thus it would date during the 13 years of Akhenaten's reign at the site.[44] Hence the historical date range might be narrowed to between c.1350/1346 BC to 1338/1334 BC.

The Amarna radiocarbon ages on both known shorter-lived samples (skins, bone and horn) and on the potentially longer-lived wood and charcoal samples, offer a tight and coherent set of results entirely consistent with the historical dates and disprove any radically different chronology: Figure III. 1.1. We can see that the final interpretation of the radiocarbon data is very much determined by the shape of the radiocarbon calibration curve in the 14th–13th centuries BC: see Figure III. 1.2. There is a sharp 'wiggle' upwards centred 1325 BC (confirmed for the east Mediterranean from Anatolian trees).[45] The Amarna data (bone sample Q-2505 perhaps apart) clearly do not match the peak of the wiggle, and thus could lie on either side. At 2σ (95.4%) confidence, we see almost equal probability for either 1389–1329 BC *or* 1323–1260 BC. The former range (and especially the most likely sub-range at 1σ confidence of 1373–1338 BC) matches the historical age estimate very closely. In support, we might note what seems to be an anomaly in the five-date set. The wood sample Q-2401 yields the second youngest (i.e. second most recent) radiocarbon age, and the animal bone sample

[40] Also Hassan & Robinson (n. 19), 123.
[41] V. R. Switsur in: Kemp, *Amarna Reports* I (1984), 178–188.
[42] Murnane & Van Siclen, *Stelae*, 73–86; Kitchen, "Chronology I", 39–52.—Kitchen (n. 24).
[43] Cf. above; Chapter II. 8.
[44] Cf. Switsur (n. 41), 181–182.
[45] Cf. n. 33.

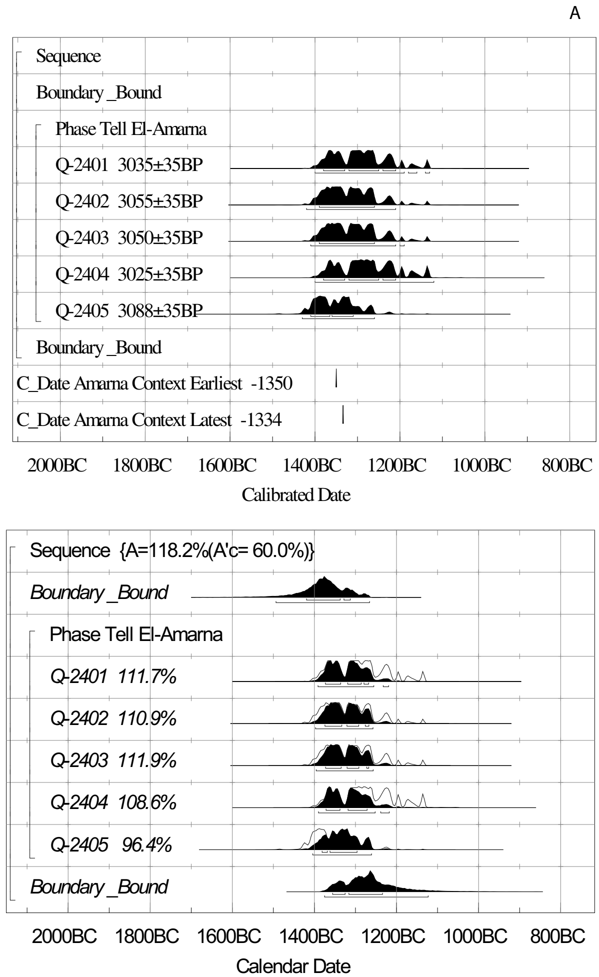


Figure III. 1.1.A. Calibrated calendar ages for the radiocarbon data reported from Tell el-Amarna, Egypt (Switsur, n. 41, 178–188) compared to the historical date for the context (see text). The upper and lower lines under each histogram indicate respectively the 1σ (68.2%) and 2σ (95.4%) calibrated age ranges. B. Sequence analysis (solid histograms) of the Amarna data (with the individual probabilities from A. indicated by the hollow histograms) as a phase within calculated boundaries. The Amarna data are entirely consistent with the historical age estimate for the context. Calibration and analysis employing OxCal 3.9 (Bronk Ramsey, n. 35 and later versions, with curve resolution set at 4) and INTCAL98 (n. 15). Q-2401, wood; Q-2402, charcoal; Q-2403, skin; Q-2404, horn; Q-2505, bone. Weighted average of all five data: 3050±16 BP (1), weighted average of just the three definitely shorter-lived samples 3054±20 BP (2). 2σ (95.4%) confidence calibrated ranges respectively (1) 1388–1331 BC (46.6%), 1322–1260 BC (48.8%), and (2) 1393–1260 BC (94%), 1228–1222 BC (1.4%).

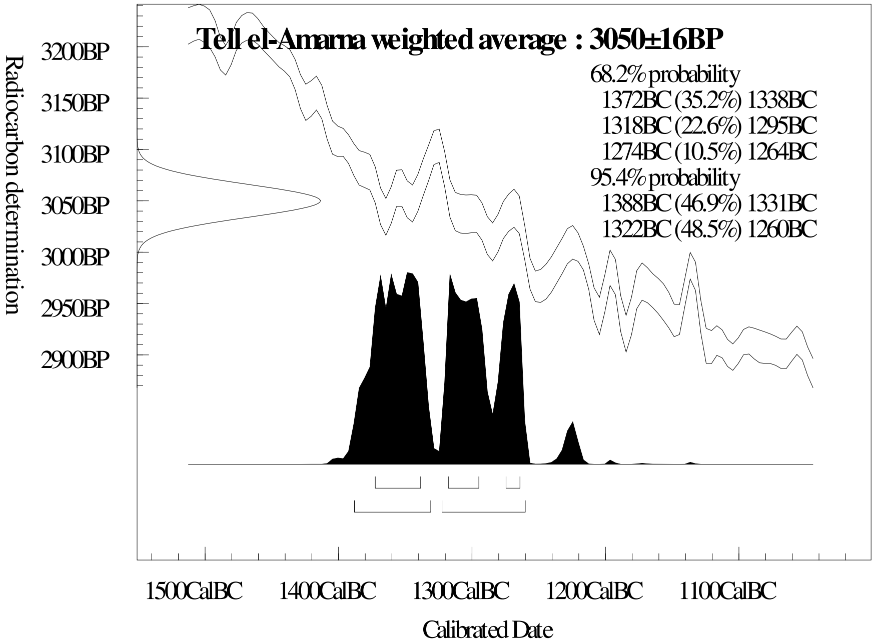


Figure III. 1.2. Calibrated probability distribution for the weighted average radiocarbon age from the five measurements on samples at Tell el-Amarna reported by Switsur, n. 41). For discussion, see text. Calibration and analysis employing OxCal 3.9 (Bronk Ramsey, n. 35 and later versions, with curve resolution set at 4) and INTCAL98 (n. 15).

Q-2405 yields the oldest age, and, in general, the average age of the likely longer-lived samples (wood and charcoal) at 3045±25BP, is (just) younger than the average age of the shorter-lived samples (animal skin, horn and bone) at 3054±20BP. Yet one would expect the wood sample to be older in real calendar terms than the animal bone sample (by a few years or even a few decades or more). Out of the dating possibilities for each sample, the only way for this likely correct sample relationship to occur is for the wood sample to date around the earliest of its three potential intercept ranges with the calibration curve at c.1368–1360 BC (and *not* c.1315–1289 BC or c.1280–1262 BC), and for the animal bone sample to date around the later of its two possible intercept ranges at c.1336–1320 BC (and *not* c.1394–1375 BC). And, plausibly, for the other three samples to date around or in between these preferred ranges. In turn, the mid to later 14th century BC date range is most likely for the Amarna samples. This is exactly compatible with, and in support of, the standard Egyptian chronology, and, via

the cuneiform text linkages attested at Amarna,[46] this finding in turn supports and requires the standard Assyrian-Babylonian chronological range for this period.[47] Hence again radiocarbon provides useful independent support to Egyptian and ancient Near Eastern chronology, and disproves attempts to install radical chronological alternatives.

4. *Past Radiocarbon Fluctuations (the Shape of the Calibration Curve), the Old Wood Problem, and Egyptian OK Radiocarbon Dates*

A study by Haas *et al.*,[48] which indicated radiocarbon ages for various OK monuments several centuries earlier than expected, was widely seen as both a problem,[49] and by some as a good reason to avoid radiocarbon dating in Egyptology. The Haas *et al.* finding was largely repeated in the followup study by Bonani *et al.*[50] But it is not at all clear that there is any unknown 'problem'. A key issue is the history of past natural radiocarbon levels; there was in effect a plateau in radiocarbon levels in the period 2900–2500 BC. This means that radiocarbon ages for the period 2900–2500 BC typically could intercept at several places with the radiocarbon calibration curve (i.e. several calendar periods have similar radiocarbon ages). For example, if we consider the OK monuments thought to be constructed c.2600–2500 BC, then the wood employed will, at the latest, have its outermost ring dating then, and the rest of the relevant tree will be progressively older. Depending on species and source of the wood, one might expect an average offset of several decades to a century, give or take a range, for an average wood sample (e.g. compare the +50 ±50 old wood adjustment estimated by Vogel *et al.*).[51] Thus the 'average' wood used in a monument

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[46] Summary in Beckerath, *Chronologie NR*, 23–24; cf. above, Chapter II. 13.

[47] J. A. Brinkman, *Materials and studies for Kassite History* (Chicago, 1976).

[48] H. Haas, J. Devine, R. Wenke, M. Lehner, W. Wölfli & G. Bonani, "Radiocarbon chronology and the historical calendar in Egypt", in: O. Aurenche, J. Evin & F. Hours, eds., *Chronologies du Proche Orient/Chronologies in the Near East. Relative chronologies and absolute chronology 16,000–4,000 B.P.* (Oxford: BAR Int. Ser. 379, 1987), 585–606.

[49] Hassan & Robinson (n. 19), 129.

[50] G. Bonani, H. Haas, Z. Hawass, M. Lehner, S. Nakhla, J. Nolan, R. Wenke, W. Wölfli, "Radiocarbon dates of Old and Middle Kingdom monuments in Egypt", *Radiocarbon* 43 (2001), 1297–1320.

[51] J. S. Vogel, W. Cornell, D. E. Nelson & J. R. Southon, "Vesuvius/Avellino, one possible source of seventeenth century BC climatic disturbances", *Nature* 344 (1990), 534–537.

built in the reign of Cheops in the mid or third quarter of the 26th century BC (conventional date ranges) likely dates during the first quarter of the 26th century BC give or take about 50 years—let us say 2587±50 BC in broad terms. If we simulate the radiocarbon age, and its calibration, for 2587±50 BC, we get a result like that shown in Figure III. 1.3. And what we find is that the shape of the calibration curve (which represents the history of past natural variations in atmospheric radiocarbon levels) yields a calibrated age that seems 100–300 years too old in the main and only just includes the real date at the very end of the calibrated range at 95.4% probability. But we calibrated the 'correct' radiocarbon age! The point is that radiocarbon dating of single context events in this period is problematic because of the history of natural radiocarbon variations. Only use of another approach (like wiggle-matching)[52] can overcome this limitation.

We can in fact generalise the *potential* and problems of OK radiocarbon dating by simulating radiocarbon ages for calendar years across this period. Figure III. 1.4 shows two runs of simulated dates at ±50 years dating precision for the period 2750–2300 BC at 25 year intervals and including also the weighted average radiocarbon ages determined and used for calibration by Bonani *et al.*[53] for the Pyramid of Snofru at Maidum and the Pyramids of Cheops, Khephren and Mycerinus at Giza. Each run of a simulation produces different data from within the possible range. Thus note how the calibrated age for 2525 BC at ±50 precision can vary quite a bit from a 'low' date range in Figure III. 1.4.A to a 'high' date range in Figure III. 1.4.B. Samples near a slope in the calibration curve have more such potential for movement; other samples are much more stable. What we see is that the four sets of Dyn. 4 pyramid data lie entirely within the expected calibrated range for real dates from c.2750 BC to 2600 BC; they could be consistent with data from as late as c.2475 BC, but clearly prefer a date range starting around 2600 BC and older (compare also Figure III. 1.3 where the data want to lie on the plateau 2850–2600 BC and not so much on the slope following c.2600 BC). Such an outcome seems entirely plausible for the non-specific wood/charcoal samples (including 'flecks

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[52] For examples at this time period, see e.g. B. Weninger, "Die Radiocarbondaten", in: M. Korfmann, ed., *Demircihüyük: Die Ergebnisse der Ausgrabungen 1975–78. II. Naturwissenschaftliche Untersuchungen* (Mainz, 1987), 4–13.—Weninger (n. 35).

[53] Cf. n. 50.

of carbon in mortar' such as from the Cheops pyramid shown in Lehner *et al.*)[54] from the Cheops, Khephren and Mycerinus monuments built in the 26th to early 25th century BC where average sample age is probably of the order of c.50±50 years at the time of inclusion into the monument. (We therefore see that the radiocarbon 'dates' thus can be valid/correct—*but* they date the 'old' wood (etc). and not the cultural/historical target date wanted: the building of the pyramid monument).

The Pyramid of Snofru at Maidum[55] provided data where six of the seven dates are closely comparable—SMU-1412 on a 'log' is either aberrant or very old wood notwithstanding the stated dating of its 'outer rings'—and five of the determinations are stated to date outer rings from wood from the burial chamber (see Lehner *et al.*)[56] or shaft thereto. Thus these samples might be expected to derive from closer to the construction period of the monument (with this period usually assumed to start at year 2 of the reign, onwards). Following the 'historical' chronology, work on this monument began c.2600 BC (Stadelmann)[57] or 2638/2588 BC (Beckerath),[58] 2616 BC (Kitchen)[59] or 2574 BC (Baines & Málek).[60] The calibrated age range of the average of these six similar ^{14}C ages given by Bonani *et al.*[61] (2855–2583 BC at 1σ, and 2860–2579 BC at 2σ) is entirely compatible at the end of its range (for why it will be just the end, see Figure III. 1.3 above) with the 'historical' age estimates (and especially not the lowest of these). The calibrated probability distribution is entirely similar with a real age of c.2600 BC (see Figure III. 1.4). One may therefore conclude that the radiocarbon ages are approximately valid.

The plateau in radiocarbon levels clearly creates difficulties for narrow dating for OK samples. However, we may make some progress with current debates. For example, Spence proposed a rather lower OK chronology based on a hypothetical stellar alignment used by the pyramid builders.[62] She proposed dates of 2526±7 BC for the start of

[54] Lehner *et al.* (n. 37), 31 bottom left illustration
[55] Bonani (n. 50), 1304.
[56] Lehner *et al.* (n. 37), 31 top right illustration
[57] R. Stadelmann, "Beiträge zur Geschichte des Alten Reiches. Die Länge der Regierung des Snofru", *MDAIK* 43 (1986), 229–240.—R. Stadelmann, *Die Großen Pyramiden von Giza* (Graz, 1990).
[58] Beckerath, *Chronologie.*
[59] Kitchen (n. 43).
[60] J. Baines & J. Malek, *Atlas of ancient Egypt* (Oxford, 1980).
[61] Bonani (n. 50).
[62] K. Spence, "Ancient Egyptian chronology and the astronomical orientation of

work at the Snofru pyramid at Maidum, 2480±5 BC for the Cheops pyramid, 2448±5 BC for the Khephren pyramid and 2415±10 BC for the Mycerinus pyramid. However, if one examines Figure III. 1.4, it is evident that the radiocarbon data from these monuments are less consistent with such a very low chronology unless very, very old wood is always assumed. The range of simulated calibrated ages for samples dating 2450–2400 BC are not at all similar with the radiocarbon ages obtained from the Khephren and Mycerinus samples. The latter clearly date much older wood, wood preferably 100–150 years older. The more traditional range of 'historical' chronology estimates provides more suitable dates (allowing for a plausible average old wood factor where relevant; cf. also below, Chapter III. 4).

Apart from the general calibration issue discussed above, some other issues may also be noted with regard to the Bonani *et al.* data sets.[63] This team has published an enormous number of radiocarbon dates from OK and MK monuments. There are wide spreads of ages in several of the sets—suggested by the team involved themselves to be partly if not largely accounted for by an 'old wood' issue, as all available trees in the region, of widely varying ages, were consumed by the pyramid builders and as older settlement debris was recycled in fires.[64] While this is plausible in many cases, nonetheless, some samples are clearly aberrant for unspecified reasons. It is undoubtedly the case that the association of measured age for the sample (biological age unless other contaminating processes were involved) versus the date for monument construction is not demonstrated or clear in a number of instances (e.g. 'charcoal' from mudbricks or from mortar—see Bonani *et al.*[65]—may easily represent 'old' or re-used tree-rings). The limestone and mortar associated with a number of samples may also provide a source of old carbon—for example with reference to samples from 'flecks of carbon in mortar' such as from the Cheops pyramid.[66] It is certainly interesting that the two secure datasets from early second millennium BC MK monuments (Pyramid of Senwosret II at Illahun and Pyramid of Amenemhet III at Dahshur), a new phase of pyramid building after a significant interval, yielded calibrated ages compatible with historical

pyramids", *Nature* 408 (2000), 320–324. Cf. D. Rawlins, K. Pickering and K. Spence, "Astronomical orientation of the pyramids", *Nature* 412 (2001), 699–700.

[63] Cf. n. 50.

[64] Lehner *et al.* (n. 37), 33.

[65] Cf. n. 50, 1297–1298.

[66] Lehner *et al.* (n. 37), 31 bottom left illustration.

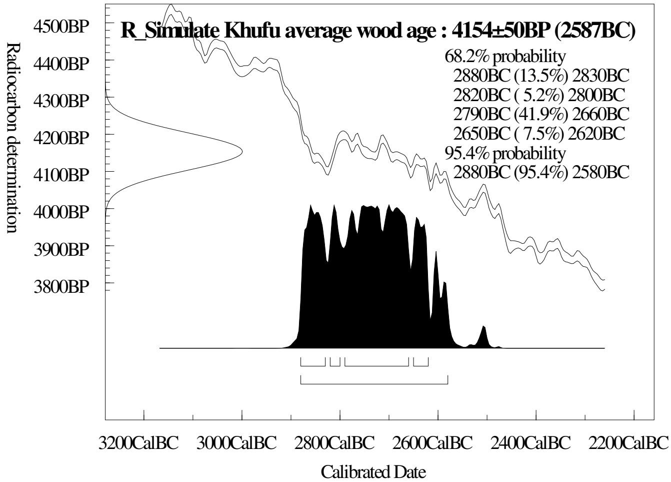


Figure III. 1.3. Simulated radiocarbon age for a calendar date of 2587±50 BC using OxCal 3.9 (Bronk Ramsey, n. 35 and later versions with curve resolution set at 4) and INTCAL98 (n. 15). Note: every simulation run produces a slightly different outcome—this is a 'typical' output based on a number of runs. This simulated calendar age is an example of possible typical age of 'average' wood from a monument built in the reign of Cheops (reign starts 2604/2593/2554/2551 BC and ends 2581/2570/2531/2528 BC: Beckerath, *Chronologie*; Kitchen n. 43; Baines & Málek, n. 60), given a typical +50 ±50 year 'old wood' adjustment. The calibrated radiocarbon age intersects with the c.2900–2500 BC plateau in the radiocarbon calibration curve, and offers several 1σ ranges within a large 2σ range c.2880–2580 BC. We thus see as a function of the natural history of radiocarbon fluctuations that real dates in the early 26th century BC yield calibrated radiocarbon ranges mainly apparently too early, with the real date just creeping into the last few years of the calibrated age range. It is noteworthy that the average radiocarbon age from the 45 samples used for the Pyramid of Cheops at Giza is in fact 4147±10BP (Bonani *et al.*, n. 50, 1315)—almost exactly the 4154BP radiocarbon age derived by the simulation of a calendar date of 2587±50 BC, as shown above. Thus it appears that the Cheops data do, on average, yield a plausible age for wood used in his reign (with this average wood typically +50 or so years in age, give or take a range, versus the actual use date—and the large range within the Cheops data, see below, indicates such a range, or more, in the real wood ages, apart from any contaminating factors from associated mortar/limestone). Because of the history of radiocarbon variations (the 2900–2500 BC plateau), only the very last part of the calibrated range indicates the real age. These data, and the other similar OK data in Bonani *et al.* (n. 50) where the 'real' age at best creeps into the end of the calibrated age range, or lies shortly afterwards, therefore do not provide evidence of any additional offset beyond old wood and the calibration outcomes given the history of natural radiocarbon levels c.2900–2500 BC. They provide no evidence at all for claims of hypothetical 100–300 years too early offsets in Mediterranean radiocarbon ages based on claims of putative upwelling of old carbon (Keenan)[67]—something for which there is no positive evidence within an order of magnitude (Manning *et al.* 2002, n. 33).

[67] D. J. Keenan, "Why early-historical radiocarbon dates downwind from the Mediterranean are too early", *Radiocarbon* 44(1), (2002), 225–237.

estimates.[68] The data from Archaic contexts also yielded radiocarbon ages largely in keeping with approximate 'historical' estimates[69]—as have other recent studies.[70] These periods both have helpful, non-plateau, radiocarbon calibration curve shapes, and may also plausibly have had less of an exhausted natural supply of wood—contrast the peak OK period of pyramid construction which probably forced much recycling of old material.[71]

For the third millennium BC, Bonani *et al.* report 17 date sets of the OK as older than their stated historical estimate, 6 as compatible, and 4 as more recent than the historical estimate. This clearly 'seems' to be a problem. But, apart from noting that the historical age estimate is commonly regarded as ±100 years for this period, the interpretation of Bonani *et al.* is based on two inappropriate starting points. First, there is no allowance for likely average sample age at time of use (i.e. 'old-wood' age for random wood/charcoal samples not known to be outer tree-rings), and second Bonani *et al.* use average values for the radiocarbon age of sample sets which contain significant internal variation, and this is thus potentially misleading (probably less so as set size increases). To illustrate: examination of Bonani *et al.* (n. 50, Fig. 1) shows the Cheops Pyramid (object number 13) to yield one of the apparently tighter calibrated age ranges and to be some two centuries older than the estimated historical age.[72] And this despite 46 radiocarbon dates being reported for the monument.[73] But examination of the 46 radiocarbon data reveals ages varying by 1210 radiocarbon years!—and even excluding the two gross outliers in the set,[74] the age range left in the set is still 513 ^{14}C years! As shown in Figure III. 1.5, just over one-third of the individual samples—the younger ages—do in fact offer calibrated ages more or less compatible with the estimated historical age of 2589–2566 BC,[75] and most of the remainder offer

[68] Bonani (n. 50), Fig. 1 and p. 1320.
[69] Bonani (n. 50), Fig. 1 object numbers 1–5.
[70] E.g. Görsdorf *et al.* (n. 22).
[71] Lehner *et al.* (n. 37).
[72] Bonani *et al.* (n. 50), 1315 use the historical range of 2589–2566 BC—other standard sources suggest c.2593–2570 BC: Kitchen (n. 43), 48; around 2604/2554 BC to 2581/2531 BC: Beckerath, *Chronologie*, 188, or 2551–2528 BC: M. Lehner, *The complete pyramids* (London, 1997), 8.
[73] Bonani (n. 50), 1305.
[74] Marked by the * and + signs by Bonani (n. 50), 1305.
[75] Bonani (n. 50), 1316.

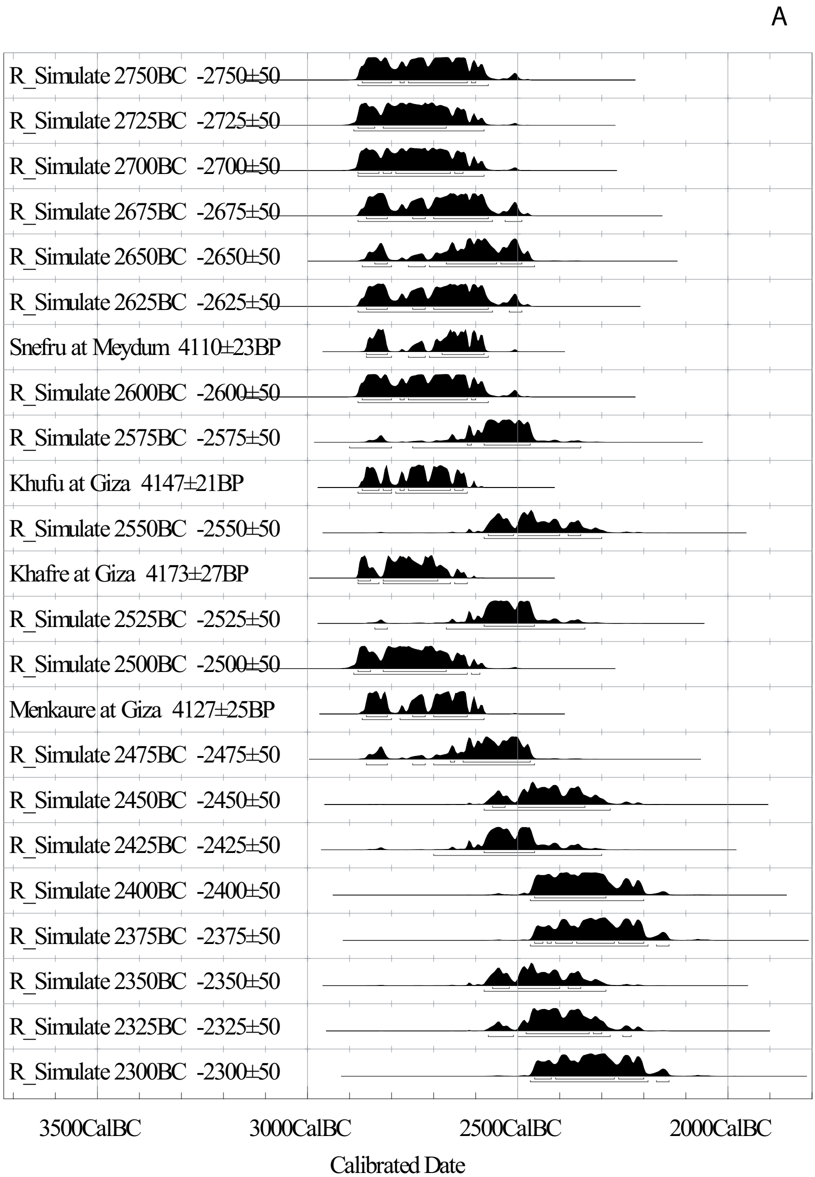
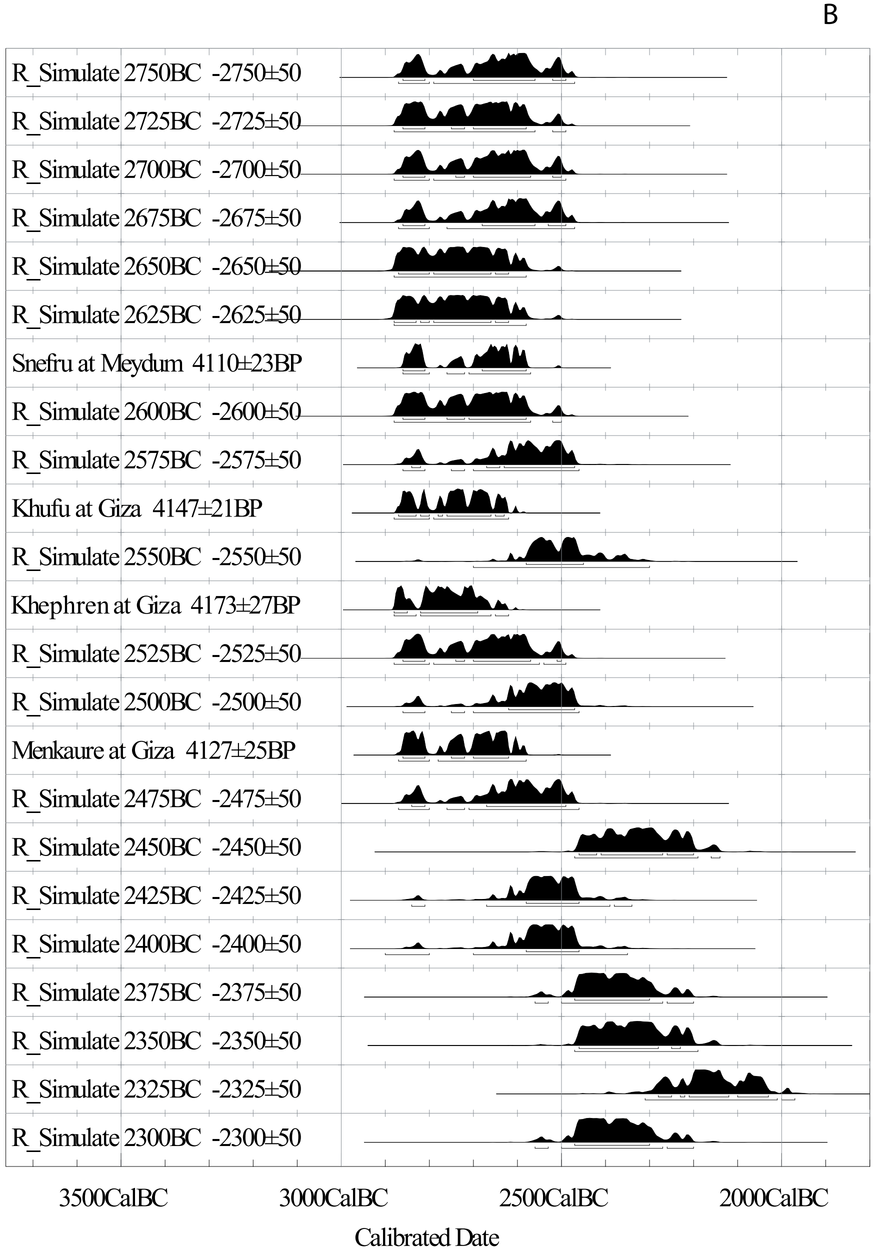


Figure III. 1.4 (A and B). Two outputs of simulations of calibrated radiocarbon ages for calendar years 2750–2300 BC at ±50 dating precision and at 25 calendar year intervals (data from OxCal 3.9 with curve resolution set at 4, Bronk Ramsey, n. 35 and INTCAL98, n. 15). Included also are the weighted average radiocarbon ages used for calibration by Bonani *et al.*, n. 50, 1314–1316) for the Pyramid of Snofru at Maidum, the Pyramid of Cheops at Giza, the Pyramid of Khephren at Giza and the Pyramid of Mycerinus at Giza. For discussion, see text.


B
R_Simulate 2750BC -2750±50
R_Simulate 2725BC -2725±50
R_Simulate 2700BC -2700±50
R_Simulate 2675BC -2675±50
R_Simulate 2650BC -2650±50
R_Simulate 2625BC -2625±50
Snefru at Meydum 4110±23BP
R_Simulate 2600BC -2600±50
R_Simulate 2575BC -2575±50
Khufu at Giza 4147±21BP
R_Simulate 2550BC -2550±50
Khephren at Giza 4173±27BP
R_Simulate 2525BC -2525±50
R_Simulate 2500BC -2500±50
Menkaure at Giza 4127±25BP
R_Simulate 2475BC -2475±50
R_Simulate 2450BC -2450±50
R_Simulate 2425BC -2425±50
R_Simulate 2400BC -2400±50
R_Simulate 2375BC -2375±50
R_Simulate 2350BC -2350±50
R_Simulate 2325BC -2325±50
R_Simulate 2300BC -2300±50
3500CalBC
3000CalBC
2500CalBC
2000CalBC
Calibrated Date

variously a little to quite a bit older ages—'old wood'[76]—would appear the obvious first hypothesis.[77] Such a pattern: younger ages corresponding to, or close to, context date and older ages reflecting old wood is quite common and expected when dealing with wood/charcoal samples.[78] Similar observations may be made about the data sets for: Step Pyramid of Djoser at Saqqara, Temple Complex associated with the Step Pyramid, Pyramid of Sekhem-khet at Saqqara,[79] Pyramid of Khephren at Giza, Pyramid of Raʿdjedef at Abu Rawash, Sphinx Temple of Khephren at Giza (n. 50, 1306), Pyramid of Mycerinus at Giza, Mortuary Temple of Shepseskaf at South Saqqara (n. 50, 1307), Mortuary Temple and Pyramid of Sahure at Abusir (n. 50, 1309) and Pyramid of Teti at Saqqara (n. 50, 1310). In contrast, it is notable that the radiocarbon ages from a modern excavation at the Royal Production Centre at Giza offer both a reasonably consistent set, and calibrated ages more recent than the surrounding OK datasets from the monuments.[80]

We have already noted the case of the Pyramid of Snofru at Maidum, where six of the determinations date outer rings from wood from the burial chamber or shaft thereto. And thus the usual old-wood effect is likely minimised. The calibrated age range of the average of these six similar ^{14}C ages given by Bonani *et al.* (2855–2583 BC at 1σ, and 2860–2579 BC at 2σ) is entirely compatible at the end of its range (for why it will be just the end, see Figure III. 1.3 above) with the 'historical' age estimate employed by Bonani *et al.* (n. 50, 1314) or those estimated by Kitchen (n. 43) or Beckerath, *Chronologie*, (higher range), and also overlaps with the date for the accession of Snofru c.2600 BC and his earlier reign, and thus the construction of this Snofru's first (of three) pyramids, given by Stadelmann (n. 57). One may observe that the stated calibrated range ends +8/+4 years from the start of the lower 'historical' age estimate for Snofru by Lehner from Baines & Málek (n. 60);[81] this is hardly a significant difference, and the wood in

[76] M. B. Schiffer, "Radiocarbon dating and the 'old wood' problem: the case of the Hohokam chronology", *JAS* 13 (1986), 13–30.
[77] See Lehner (n. 37), esp. 31–33.
[78] For an example from Troy II, see Kromer *et al.* (n. 34), 48 and Fig. 4.
[79] Bonani (n. 50), 1303.
[80] Bonani (n. 50), Fig. 1 object 12, contrasted with other objects 10–19. One might speculate that the samples from this context, which are not from major architecture/monuments and their creation industries, do not therefore suffer so much from an average old wood problem.
[81] Lehner (n. 72).

question could easily have been cut a few years earlier than the start of Snofru's reign if the lower dates are to be preferred, just as it could have been cut during his reign if the slightly higher dates are preferred. We have already seen how even the correct radiocarbon age for a date around the early 26th century BC only includes the real calendar age within the very end of the calibrated range, as much of the dating probability ends up on the plateau in the radiocarbon curve over the preceding couple of centuries (compare Figure III. 1.3 above). Thus these dates for the Pyramid of Snofru at Maidum are entirely consistent with the estimated 'historical' age.

In sum, these OK radiocarbon dates do not in fact indicate any problem with radiocarbon dating and Egyptian chronology; instead they nicely illustrate the importance and impact of the shape of the calibration curve in dating, and they highlight the need to obtain organic samples directly associated with, and relevant to, the human context for which a date is sought. Wood and charcoal samples especially can easily be older, or even much older, than their final deposition context depending on tree species and the uses and perhaps re-uses of the wood. Add in calibration taphonomy and correct radiocarbon ages for organic materials can appear to yield dates that are centuries too old for their historical/archaeological context (see Figure III. 1.3). Aquatic samples, which may include a water/marine reservoir radiocarbon age (versus solely the normal atmospheric reservoir radiocarbon age represented in normal terrestrial plants, and animals eating these), must also be treated with care and caution—again this may explain some of the apparently aberrant radiocarbon ages obtained on 'reed' samples in Egypt.

As evident from the Amarna example in Section 3, and other studies cited in Sections 1 and 2, or other studies in the literature,[82] in appropriate circumstances high-quality radiocarbon data from Egypt and the east Mediterranean region can provide accurate and precise dates).[83] When issues occur, such as the completeness of removal of age contamination by humic material,[84] or the old wood offsets evident in the extensive OK radiocarbon measurements published by Bonani *et al.*

[82] M. Lange, "Wadi Shaw 82/52: ^{14}C dates from a peridynastic site in northwest Sudan, supporting the Egyptian historical chronology", *Radiocarbon* 40 (1998), 687–692.

[83] See also Manning *et al.* (2002, n. 33).

[84] Alon *et al.* (n. 39).

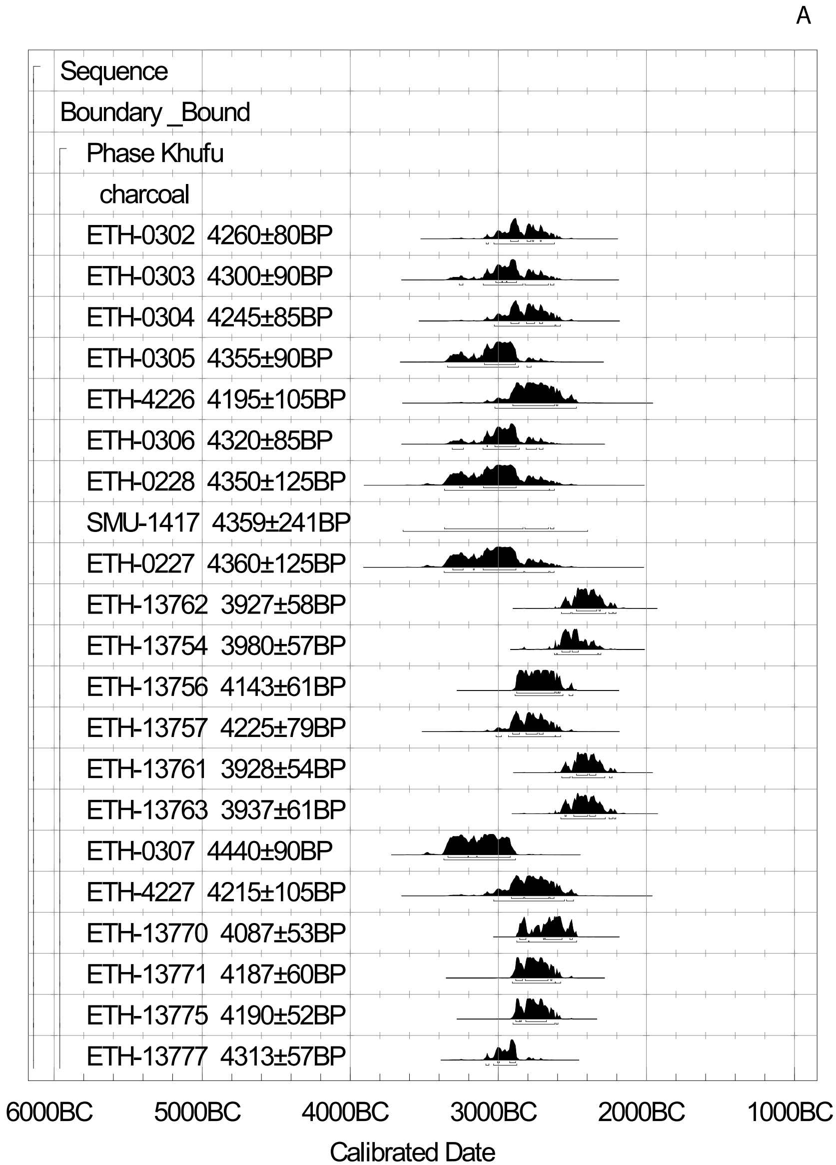
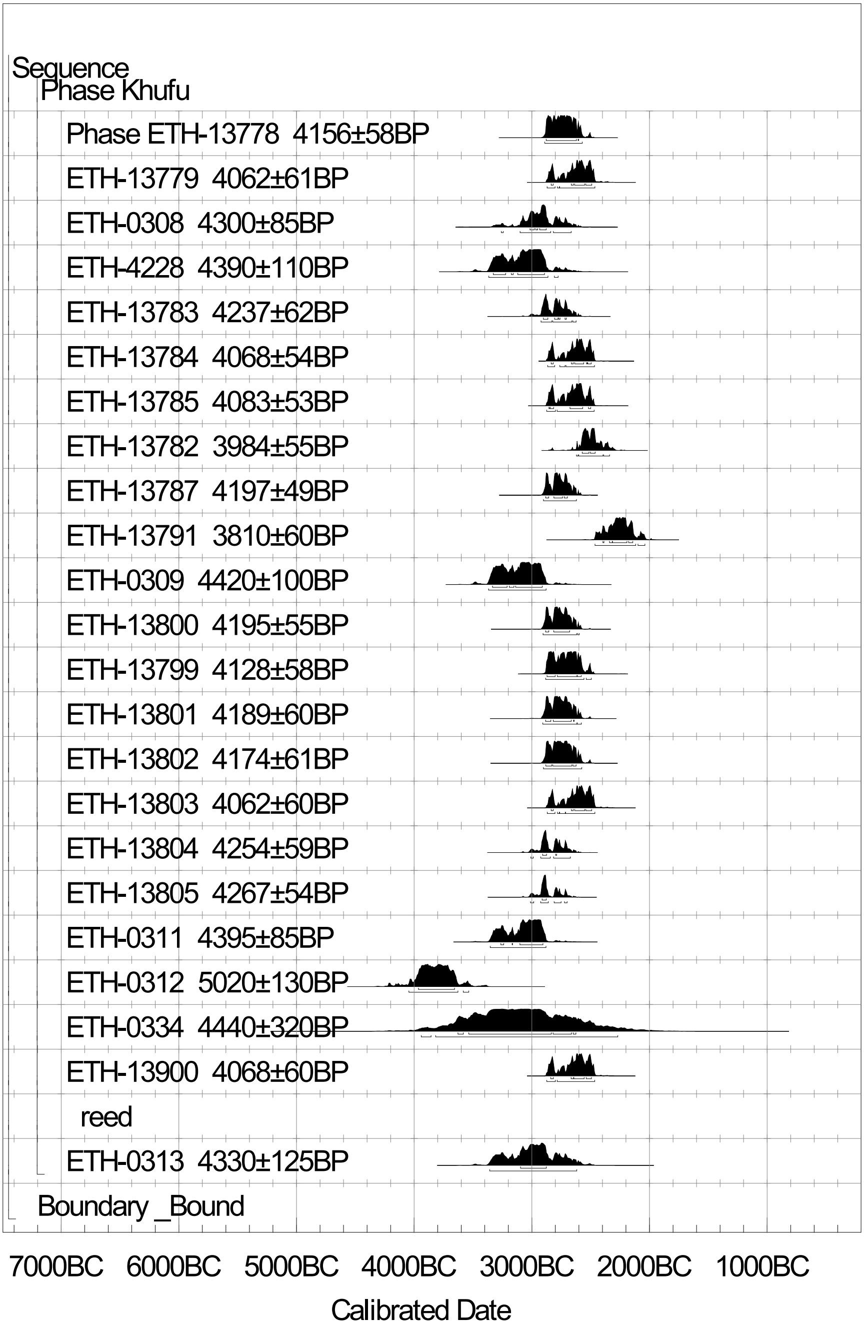


Figure III. 1.5 (A and B). Calibrated calendar ages for the 46 radiocarbon data reported from the Pyramid of Cheops at Giza (data from Bonani *et al.* n. 50, 1305). The estimated historical age employed by Bonani *et al.* (n. 50, 1315) is 2589–2566 BC. The upper and lower lines under each histogram indicate respectively the 1σ (68.2%) and 2σ (95.4%) calibrated age ranges. Calibration employing OxCal 3.9 (Bronk Ramsey, n. 35 and later versions, with curve resolution set at 4) and INTCAL98 (n. 15). For discussion, see text.

B


Sequence
Phase Khufu
Phase ETH-13778 4156±58BP
ETH-13779 4062±61BP
ETH-0308 4300±85BP
ETH-4228 4390±110BP
ETH-13783 4237±62BP
ETH-13784 4068±54BP
ETH-13785 4083±53BP
ETH-13782 3984±55BP
ETH-13787 4197±49BP
ETH-13791 3810±60BP
ETH-0309 4420±100BP
ETH-13800 4195±55BP
ETH-13799 4128±58BP
ETH-13801 4189±60BP
ETH-13802 4174±61BP
ETH-13803 4062±60BP
ETH-13804 4254±59BP
ETH-13805 4267±54BP
ETH-0311 4395±85BP
ETH-0312 5020±130BP
ETH-0334 4440±320BP
ETH-13900 4068±60BP
reed
ETH-0313 4330±125BP
Boundary _Bound
7000BC 6000BC 5000BC 4000BC 3000BC 2000BC 1000BC
Calibrated Date

(n. 50), they in fact lead us to consider important topics concerning taphonomy, sample diagenesis, social history, economic processes, and the environment. As Lehner *et al.* conclude with regard to the OK issue:[85]

> If the fair agreement of our 1995 results with historical dates and previous radiocarbon dates for the Archaic period and with the historical dates for the MK hold, the problematic OK dates are boxed in. And therein may lie a hint of multifaceted old wood effects for a period, especially from Djoser to Mycerinus, when any and all wood resources may have been consumed at a whole other order of magnitude than before or after the giant pyramid-building projects . . . our project . . . now has us thinking about forest ecologies, site formation processes, and ancient industry and its environmental impact . . .

5. *Caution: The Need to Make Only Secure Historical Associations is Paramount*

Radiocarbon dating determines the age of an organic sample. The association of such a sample and its radiocarbon age with history/archaeology is the task of the archaeologist. And one has to be careful and rigorous. Associations must be demonstrated, not casually assumed. A recent example illustrates the potential problems and the need to be even more careful as better precision becomes available in modern radiocarbon dating.

Shoshenq I and Radiocarbon?

A key synchronism for the standard chronology of Egypt (and wider Near Eastern history) concerns the identification of the important Egyptian pharaoh Shoshenq I with the Shishak attested in the Bible (I Kings 14:25–26; II Chronicles 12:3–4) as invading Judah and Israel in the 5th year of Rehabeam.[86] Rehabeam year 5 is in turn dated c.926/925 BC by linking the attested names and reign lengths of the 10th–9th century BC kings of Israel and Judah with recorded synchronisms in the 9th century BC between the Israelite kings Ahab and Jehu and the

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[85] Lehner (n. 37), 33.

[86] Kitchen, *TIP*, esp. xliv, 72–76, 287–302; Kitchen (n. 24), 7–8; Beckerath, *Chronologie NR*, 30–34; idem, *Chronologie*, 68–70.

Assyrian king Shalmaneser III. Since the chronology of the Assyrian kings is effectively absolute back to the 10th century BC, this enables precise calendar dates to be applied (of respectively c.853 BC for the last year of Ahab's reign and c.841 BC for the first year of Jehu's reign).

In an important and controversial paper, Bruins *et al.* (2003) recently reported sets of high-precision radiocarbon dates, allied with an interpretative stratified archaeological wiggle-matching analysis, from the site of Tel Rehov in Israel.[87] These samples, on high-quality short-lived samples, provide the basis for a high-resolution chronology for the site in the 12th through 9th centuries BC. But Bruins *et al.* also suggested that the date for the destruction of Stratum V at Tel Rehov could be associated with the campaign of Shoshenq I and thus their date for this stratum—c.940–900 BC—was argued to support this proposed identification, and in turn the standard Egyptian chronology or one very close to it (with the Shoshenq I invasion dated c.926/925 BC—see above, or various slight alternative calculations, such as the 918 BC of Miller and Hayes,[88] cited by Bruins *et al.* (n. 35) 317, or 927 BC in Barnes[89] or 922–921 BC in Hayes and Hooker.[90]

However, the critical logical step was missing. There is no evidence at all that the Stratum V destruction links with Shoshenq I—this is merely an unproven and (unnecessary) assumption incorporated into the Bruins *et al.* paper and its dating model (and so leads to a circular argument). The dating of the site and the dating of Shoshenq I are separate until and unless clear evidence can be produced to show that Shoshenq I caused the specific Stratum V destruction horizon dated by the radiocarbon measurements. Archaeologists must always be aware that non-rigorous and specific (i.e. documented) assumptions that try to bring archaeological and historical evidence together (the event-historical model) are often inherently problematic because the respective evidence types represent fundamentally different facets of

[87] Bruins *et al.* n. 35.
[88] M. Miller & Hayes, *A history of ancient Israel and Judah* (Philadelphia, 1986).
[89] W. H. Barnes, *Studies in the chronology of the divided monarchy of Israel* (Cambridge, Mass., 1991).
[90] J. H. Hayes & P. K. Hooker, *A new chronology for the kings of Israel and Judah and its implications for Biblical history and literature* (Atlanta, 1988).

historical reality.[91] In the Shoshenq I case, it is fair to note that much is less than certain and very different narratives are possible based on the same limited and likely non-contemporary 'historical' evidence/tradition.[92]

This example highlights the need to delineate clearly what is the target date and how and why the relevant organic samples do (or do not) provide associated dating evidence when radiocarbon dated. Without such chronometric care results are not credible, and conclusions may turn out to rest on foundations of sand.

6. *Conclusions*

High quality radiocarbon dating offers an important but as yet not fully exploited resource for Egyptology. It provides an increasingly accurate and precise test for the historical chronology and can actively inform and resolve disputes in less certain or ambiguous periods. Available dating accuracy and precision from radiocarbon should in principle—i.e. on suitable short-lived samples from primary contexts dated at good precision—offer a chronological precision for the third millennium BC of the order of, or better than, the historical age estimates—which, for this period, are often regarded as having a significant error margin of up to a century. It could test and resolve claims for significantly differing

[91] A. M. Snodgrass, "Archaeology", in: M. Crawford, ed., *Sources for ancient history* (Cambridge, 1983), 137–184.—Idem, *An archaeology of Greece: the present state and future scope of a discipline* (Berkeley, 1987), 37–66.

[92] I. Finkelstein, "The campaign of Shoshenq I to Palestine: a guide to the 10th century BCE polity", *ZDPV* 118 (2002), 109–135.

Postscript. Since the present text was submitted in August 2003, there have been several further publications (and much discussion) taking this topic now well beyond the initial publication of Bruins *et al.* (2003) cited above. However, the logic/methodology point noted in the text remains relevant as outlined (and has since been accepted by the Bruins *et al.* authorship—I wish to thank Hendrik Bruins and Amihai Mazar for friendly, constructive, and productive discussion). For the latest (AD 2005) situation on the analysis of the important Tel Rehov datasets, see now (i) Mazar, A. *et al.* "Ladder of Time at Tel Rehov: Stratigraphy, Archaeological Context, Pottery and Radiocarbon Dates", and (ii) Bruins, H. J. *et al.* "The Groningen Radiocarbon Series from Tel Rehov: OxCal Bayesian Computations for the Iron IB–IIA Boundary and Iron IIA Destruction Events", both papers in *Radiocarbon Dating and the Iron Age of the Southern Levant—the Bible and Archaeology Today*, edited by Thomas Levy and Thomas Higham, Equinox Publishing, Ltd., London (2005), 193–255, and 271–293 respectively.

dates, such as those suggested from speculative astronomical conjecture by Spence (n. 62).

For the second millennium BC radiocarbon may also be able to assist. For many non-elite contexts it may offer the best means of dating. For the chronology of the pharaohs it will be of less need, as the dates in the second millennium BC are relatively accurately and precisely determined from a combination of so-called 'dead-reckoning' (the compilation of documented names of Egyptian kings and various other persons and attested years of reign/office backwards from an agreed starting point fixed against the Greco-Roman timescale)[93] and analysis of some records of astronomical observations (e.g. Krauss;[94] Beckerath).[95] Recent scepticism, and claims to reject for example all lunar data (Wells[96]—approvingly cited by e.g. Kitchen),[97] have been shown to be based on incorrect or partial understanding of the data and their analysis.[98]

The leading scholars immersed in the details argue that this combination of historical data and astronomical evidence forms a closely dated chronological system for the second millennium BC, with only at most a few years to a decade or so error range, and with several likely absolute placements therein, such as the accession of Tuthmosis III in 1479 BC.[99] Nonetheless, one role for radiocarbon will be to offer an independent check and verification of these chronologies. Without this, complete certainty will never be possible given that there are gaps and uncertainties/ambiguities in the evidence (textual or astronomical), and key assumptions/interpretations have been made by modern scholars. Radiocarbon dating is direct and independent, and can cut through circular debates and assumptions.

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[93] Kitchen, *TIP*; idem, "Chronology I"; idem n. 24.

[94] Krauss, *Sothis*.

[95] Beckerath, *Chronologie*, 41–51.

[96] R. A. Wells, "The role of astronomical techniques in ancient Egyptian chronology: the use of lunar month lengths in absolute dating", in: J. M. Steele & A. Imhausen, eds., *Under one sky: astronomy and mathematics in the ancient Near East* (Münster, 2002), 459–472.

[97] Kitchen, n. 24 at p. 11.

[98] R. Krauss, "Ronald A. Wells on astronomical techniques in Ancient Egyptian Chronology", *DE* 57 (2003), 51–56.

[99] Kitchen, *TIP*; n. 43; n. 24; Beckerath, *Chronologie NR*; 1997; cf. below, Chapter III. 8.

High-quality radiocarbon dating also offers the independent means to test and reject the several publications of the last decade which have argued that conventional Egyptian (and wider ancient Near Eastern) historical chronology is incorrect.[100]

Radiocarbon dating should become the friend of Egyptologists. Whereas in its origins Egyptology helped to test radiocarbon dating and to expose the need for calibration, modern radiocarbon dating now offers the means to test, support, extend, and even to refine Egyptian chronology. Certain periods like the OK will be problematic if samples or contexts are dated in isolation thanks to the unhelpful plateau in the calibration curve (see Figure III. 1.3 above); but by exploiting techniques like seriated archaeological wiggle-matching (ideally of short-lived samples tied securely to the context for which a date is sought), even this time period can be made to yield an accurate and precise calibrated radiocarbon chronology by taking advantage of the shape of the calibration curve.[101] Radiocarbon dating also offers the route to engage with all those many Egyptian archaeological contexts not specifically linked with the (largely elite centred) textual record (compare the similar but still largely unfulfilled hope expressed twenty years ago by O'Connor.[102] The entirety of Egyptian archaeology can then be integrated into an accurate and precise near-historical level timeframe.

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[100] E.g. J. Goldberg, "Centuries of darkness and Egyptian chronology: another look", *DE* 33 (1995), 11–32.—G. Hagens, "A critical review of dead-reckoning from the 21st Dynasty", *JARCE* 33 (1996), 153–163.—James *et al.* (n. 25), (n. 26).—Rohl n. 25.—P. Van der Veen & W. Zerbst, *Biblische Archäologie am Scheideweg?* (Holzgerlingen, 2002).

[101] See e.g. Weninger (n. 52); Weninger (n. 35).

[102] D. O'Connor, "New Kingdom and Third Intermediate Period", in: B. G. Trigger, B. J. Kemp, D. O'Connor & A. B. Lloyd, *Ancient Egypt: a social history* (Cambridge, 1983), 183–278, esp. 185.

Appendix

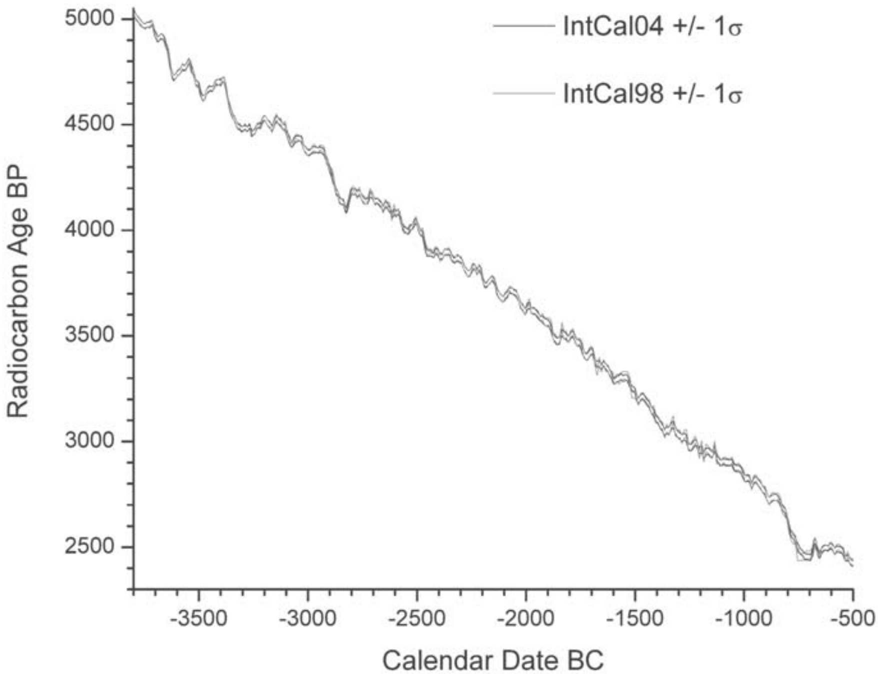


Figure III. 1.6. The new (AD 2005) IntCal04 radiocarbon calibration curve (black) at 1σ for period 500 BC to 3500 BC, compared to the previous IntCal98 curve (grey) as used in this paper. There is little significant difference—the main change is that the IntCal04 curve is a little more smoothed. Data from Reimer *et al.* (n. 32) and Stuiver *et al.* (n. 15).

III. 2 ABSOLUTE CHRONOLOGIES: LUMINESCENCE DATING OF EGYPTIAN ARTEFACTS

Christian Goedicke

The phenomenon of luminescence in solids has been used as a dating method in archaeology since the late 1960s. Since then the method developed as an important and universal tool alongside radiocarbon dating and dendrochronology. It is based on the property of a number of minerals to store and release radioactive decay energy. Two minerals frequently occurring in archaeological contexts, quartz and feldspar, show this effect very distinctly which makes the application of luminescence analysis in archaeology particularly useful. In the field of the geological sciences luminescence dating has caused a decisive increase of knowledge and is regarded meanwhile as indispensable. In the following it will be discussed in which parts of archaeology the use of the method may be inadequate.

Luminescence Dating: Basic Principles

Radioactive traces (U-238, U-235, Th-232, K-40, Rb-87) are constituent in clay, in soil, and in rocks. During spontaneous decay, these elements release energy into the environment. When quartz or feldspar occurs in the environment, the emitted energy may be stored in the crystal lattice of these minerals. After an archaeological storage time the stored energy can be released in form of light. The longer the archaeological storage time, the larger the accumulated energy (phys. the *dose*) and the stronger the light signal. Luminescence dating is a dosimetric dating method requiring no external calibration. The necessary zero-setting event is achieved by heating or exposure to light when the energy stored in the lattice over geological times is zeroed and the accumulation can begin again.

Due to different ranges and to different effectiveness in producing luminescence, the three types of radioactive decay radiation (alpha-, beta- and gamma radiation) need to be taken into account separately. Consequently, more than one physical quantity must be measured in

the laboratory and, hence, the number of measurements results in a complex error of the age which is one of the major differences from C-14 dating. The total error of a thermoluminescence single date of an object amounts to between 7 to 12% of the total age expressed in years. In absolute numbers this amounts to roughly ±450 years for an OK date. The range of uncertainty is much smaller, if several samples from the same archaeological context are analyzed; the so-called context error can be reduced to approx. ±5% which still corresponds to ±230 years for the OK.

Thermoluminescence ages are calculated according to the following formula:

$$\text{age} = \frac{\text{archaeological dose}}{\underbrace{a\cdot \text{dose-rate}_\alpha + \text{dose-rate}_\beta}_{\text{internal dose-rate}} + \underbrace{\text{environmental dose-rate}}_{\text{external dose-rate}}} \qquad \text{(Eq. 1)}$$

A feature peculiar to Egyptian artefacts is the low radioactive trace-element content which explains the low internal dose-rates frequently encountered in Egyptian artefacts. Consequently, thermoluminescence ages become dependent on the ratio of the internal to external dose-rate (see Eq. 1). Should the two dose-rates come close to or equal each other, the external dose-rate may determine the thermoluminescence age. Fig. III. 2.1 illustrates the effect of the dose-rate ratio on the thermoluminescence age.

Thermoluminescence produces the best results when applied to artefacts as they are excavated, i.e. when the measurement of the environmental dose-rate can be made on-site. No access to the site limits the usefulness of the method, e.g. analysis of museum objects of unknown provenance cannot produce definitive results. The humidity of a sample also requires access to the site, as humidity is a correcting factor for the age of a sample. Variation of the humidity during storage times has to be taken into account.

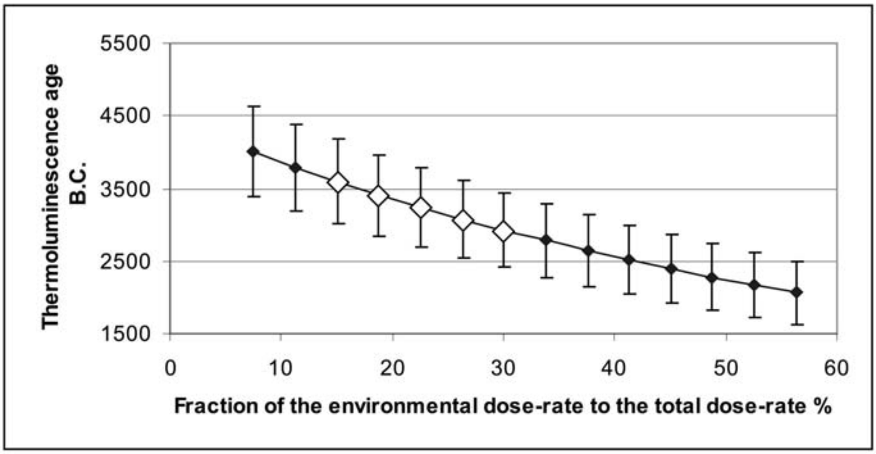


Fig. III. 2.1. Effect of the environmental dose-rate on thermoluminescence age; the example shows a typical ceramic sample from the OK. The fraction of the environmental dose-rate most probably prevailing in Egypt lies between ca. 15 and 30.

Luminescence techniques can be used to date:

A. fired materials: ceramics (minimum firing temperature 500°C), stones (firesides), casting cores of bronzes
B. unfired materials: sediments (aeolian, fluvial, colluvial), mortar

How Useful is Luminescence Dating for Dynastic Egyptian Objects? Answers Based on Published Dates

Considering the usual error margins of 7–12%, thermoluminescence dating of Egyptian artefacts cannot contribute much to chronological evidence. The method may prove useful for a piece which cannot be attributed to any period on stylistic criteria. Even the range of context errors exceeds the possible imprecision of the Egyptian chronology which in its present state is better than 5% in all periods. Hence it is not surprising that published examples of luminescence dating for Egyptian artefacts are few. Recent culling of various bibliographical sources including CAS (chemical abstracts services) turned up the following papers.

Thermoluminescence Dates Quoted in the Literature

Two nearly identical papers deal with pottery of the fourth dynasty.[1] The instrumentation used and the reported error of 2.3% cast some doubt on the seriousness of both; the standard calculation will not result in an error that small.

A French team notes that the pigment Egyptian Blue results from a thermal reaction thus making dating of this material possible.[2] The attempt to date a large chunk of Egyptian Blue from Karnak is described resulting in a reasonable date. However, dating pigments from paint-layers is not feasible due to dosimetry problems arising from paint-layer thickness which usually is smaller than the range of beta-particles.

Some unpublished results of the author (Rathgen-Forschungslabor in Berlin) on potsherds from excavations at Abu Minshat Omar can be mentioned here. A comparison of the results with radiocarbon data from the same site revealed a systematic deviation towards younger ages.

Samples of vitrified silt from the Early Dynastic tombs at Abydos turned out to be undatable. Secondary firing resulted in a high degree of vitrification making luminescence dating impossible.

For earlier periods with a comparatively fluid chronological framework luminescence dates, even including the above quoted errors, may furnish a valuable chronological contribution. However, even for this period luminescence has rarely been used. Whittle's early study dealt with potsherds from Hemamieh and Qurna-Tarif.[3] Environmental dose-rate data were obtained in the laboratory by alpha-counting of soil samples. An archaeological evaluation of the data obtained was not attempted. Two additional studies considered Middle Palaeolithic

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[1] S. A. Elfiki, M. S. Abdelwahab, N. Elfarawamy & M. A. Elfiki, "Dating of ancient Egyptian pottery using thermoluminescence techniques", *Nuclear Instruments and Methods* 94 (1994), 91–94.—M. S. Abdel-Wahab, S. A. Elfiki, M. A. Elfiki, M. Gomaa, S. Abdel-Kariem & N. El-Faramawy, "Annual dose measurements and TL-dating of ancient egyptian pottery", *Radiation Physics and Chemistry* 47 (1996), 697–700.

[2] M. Schvoerer, M. C. Delavergne & R. Chapoulie, "The thermoluminescence of Egyptian Blue", *Nuclear Tracks and Radiation Measurements* 14 (1988), 321–327.

[3] E. H. Whittle, "Thermoluminescent dating of Egyptian pre-dynastic pottery from Hemamieh and Qurna-Tarif", *Archaeometry* 17 (1975), 119–122.

settlements.[4] Dating Neolithic cultures by thermoluminescence and radiocarbon in the Sudan Nile valley was the aim of a French working group.[5]

Outlook

Luminescence techniques other than thermoluminescence, e.g. optically stimulated luminescence (OSL), are not very likely to improve the situation; conversely, the sensitive dependence on the dose-rate ratio will become even more important. Corresponding to the zero-setting event (bleaching by sun-/daylight) these techniques are more appropriate for use in geological sciences. About half a dozen studies devoted to sediment dating and shoreline development have been done.[6]

[4] N. Mercier, H. Valladas, L. Froget, J. L. Joron, P. M. Vermeersch, P. Van Peer & J. Moeyersons, "Thermoluminescence dating of a Middle Palaeolithic occupation at Sodmein Cave, Red Sea Mountains (Egypt)", *Journal of Archaeological Science* 26 (1999), 1339–1345.—P. M. Vermeersch, E. Paulissen, S. Stokes, C. Charlier, P. Van Peer, C. Stringer & W. Lindsay, "A Middle Palaeolithic burial of a modern human at Taramsa Hill, Egypt", *Antiquity* 72 (1998), 475–484.

[5] P. Guibert, C. Ney & M. Schvoerer, "Datation croisée TL/C14 de cultures néolithiques de la Vallée du Nil, Soudan, sites d'El Kadada et d'El Ghaba", *Archéologie du Nil Moyen* 5 (1991), 129–141.—P. Guibert, C. Ney, F. Bechtel, M. Schvoerer & F. Geus, "TL and radiocarbon dating of neolithic sepultures from Sudan: intercomparison of results", *Radiation Measurements* 23 (1994), 393–398.

[6] O. Bubenzer & A. Hilgers, "Luminescence dating of Playa Sediments of the Egyptian Plateau, Western Desert, Egypt", *Quarternary Science Reviews* 22 (2003), 1077–1084.—H. M. El-Asmar & P. Wood, "Quaternary shoreline development: the northwestern coast of Egypt", *Quaternary Science Reviews* 19 (2000), 1137–1149.

III. 3 DENDROCHRONOLOGY

Otto Cichocki

Definition

Dendrochronology is the science of dating tree rings. It includes investigations of the information provided by/contained in the structures of dated ring sequences and its applications to environmental and historical problems/questions.[1]

History

The astronomer Andrew S. Douglass expected to find growth reactions to the sun-spot cycle, when he measured the width of tree rings of old pine trees. What he found was a similar pattern of ring width common to trees growing in the same area at the same time. He applied this discovery to develop a method to date the remains of pueblo settlements in the American Southwest.[2]

Subsequently the method was continually improved, especially by computer based statistical analysis in laboratories worldwide.

Biological Background

In regions with seasonal variation the growth of trees and other woody plants is not an invariable process but influenced by climatic factors. Particularly outside the tropical and subtropical zones, growth stops

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[1] M. Kaennel & F. Schweingruber, *Multilingual Glossary of Dendrochronology. Terms and Definitions in English, German, French, Spanish, Italian, Portugese and Russian* (Bern, 1995), 91 (modified).

[2] A. E. Douglass, "The secret of the southwest solved by talkative tree rings", *National Geographic Magazine* 54 (1929), 737–770. Idem, "Dating Pueblo Bonito and other ruins of the southwest", *National Geographic Society. Contributed technical papers. Pueblo Bonito series* (Washington, 1935), 1–74.

almost completely in winter, causing a distinct border between each annual increment. Depending on genus and species, these "tree-rings" are composed of different cells in different arrangements. Early wood is springwood formed at the beginning of the growing season for conducting liquids, while late wood grows in late summer and autumn and is composed mainly of cells with thicker walls. Both together form a tree-ring. The thickness of the ring is more or less correlated with precipitation (if this is the determining factor), with density corresponding to the average temperature of the growth season. Of course, other climatic factors, but also insect damage, wounding or the climatic situation of previous years, affect growth as well. Therefore each tree ring is the result of a very complex accumulation of influences.

Trees growing in tropical and subtropical zones also form layers of different cell arrangement, but since they lack distinct borders, these layers cannot be measured for dating purposes. As annual thickness growth is the result of the reaction of trees to ecological influences, in an area with similar influences the growth reactions of different trees on comparable stands in the same year will be similar.

Sampling, Data Acquisition, and Synchronisation

Old wood may be preserved in different conditions:

Dry preservation: wood is almost unaltered, but sometimes fragile. It can be found in buildings (used to reinforce walls, construct ceilings, roofs, lintels, or doors), in burials (coffins, other wooden objects, burial chambers), as the ground of a painting (icons, Fayum portraits), sculptures and other objects.

Wet-wood preservation: wood is almost unaltered, but very sensitive to drying (necessitating storage in water, in a cool and dark environment). It can be found in rivers, lakes, caves, at the bottom of wells (often together with other organic remains of importance).

Charcoal preservation: burning changes wood—it is chemically resistant, but very fragile. If thicker beams are visible, they should be excavated separately, bandaged and parts plastered together and packed in plastic but not sealed to allow a very slow drying. Cool and dark storage is best.

To measure the thickness of rings in a particular piece of wood, a cross-section is required. A disc can be cut from wooden architectural elements or a core removed with a drill. After smoothing the surface,

the ring borders become visible. In most cases mixing samples of different wood species is not recommended when constructing a standard, so wood species analysis (identification of anatomical structures of a very small sample with the help of a light microscope) of all objects available for investigation should be the initial step.

If the surface (square or longitudinal) of a wooden object is not covered with paint and has been well smoothed when made in antiquity, the rings can often be measured directly after preliminary cleaning. Measuring devices have been developed for this purpose since most items in museum collections are only available for non-invasive "on the object" measurements.[3] VideoTimeTable equipment uses a digital video camera with macro lens, which is moved along the surface by a step motor. A live video image, displayed on a laptop, can be measured immediately. Plain surfaces can be investigated with the help of a modified high-resolution flatbed scanner. A device capable of drilling a 5mm diameter hole for endoscopic measurement of ring width was designed to measure objects with paint or other surface treatment.

At least two radii of a sample must be measured. The arithmetical mean value of the ring widths is calculated to compensate for biological diversity (e.g. elliptic ring shape, single growth deviations). The result is a list of mean growth-ring thickness for each year contained in the sample. A sample must contain at least 70 rings; otherwise in many cases the statistical methods used for dating cannot work. Exceptions to this rule are separate pieces of a single stem (e.g. charcoal), collected as a unit. In this case much shorter overlaps allow reconstructing the whole ring sequence of the stem because of almost identical ring patterns. It is necessary to collect and measure as many promising samples as possible from one complex (a "time-unit") in order to calculate a reliable mean value list for further analysis.

Constructing Standards

Two samples grown at the same time in the same climatic conditions will show a statistically significant correlation of their distribution of wide and thin rings (respectively their mean values). Such tree-ring

[3] B. Knibbe & O. Cichocki, "Developing new tools for the SCIEM 2000 project", *Dendrochronologia*, in press.

patterns are significant for a certain time period, and a certain climatic region, but in many cases only for a single genus (or species) of trees. Cross dating (the statistical comparison of two mean value lists) aims at the synchronization of different samples and determining relative time span between them.

If two samples do not completely overlap in time, their mean pattern will be longer than one of the individual samples. Many successfully cross-dated overlapping samples from different periods—the youngest one being of known age (e.g. a recently cut tree)—allow constructing a tree ring standard (a dated chronology) valid for one species and a limited growth area. If a gap is open (a sample is missing), the isolated part is called a floating chronology.

Dating of Samples

Dating a sample means comparing a sample with a standard on a year-to-year basis to find the best matching position. In many cases statistical tests result in more than one possible date. To find the correct position, "pointer years" and additional statistical tests are used. When setting up a standard by cross-dating all contained samples, certain years form pronounced peaks in the graph. If more than 75 percent of the rings from one year have the same trend (increasing or decreasing growth compared with the preceding ring), this year with especially strong influence on growth is called a "pointer year" and is specially marked. In dubious cases, in a second match, only these pointer years are compared with the corresponding rings of the sample. The correct position will then show a significantly higher correlation of these special years than the other theoretically positions.

The skeleton plot is a special method for dry areas using minimum pointer years. Here, only very narrow rings are observed, as they are formed by drought, that makes moisture the factor limiting growth. In years with poor environmental conditions some species cannot create distinct rings in the entire circumference of a stem or branch. If these missing rings go undetected, the sample will not match well with the standard. If this occurs when the standard is being set up, results will be negatively effected. Detection is possible by comparing many samples, because the same ring is not usually missing in all of them. The best way to detect incomplete rings is by comparing different radii on cut discs.

Another misleading growth pattern may occur in years with a temporary period of low temperature or drought during the growing season which produces a "false ring". This "late wood formation" within the ring has a much smoother outer border than the real late wood formed at the end of the growth season. Hence, it can be detected under the microscope. As climatic factors are the reason certain rings are formed, it is possible to extract a basic part of this information contained in the ring. Dendroclimatology is concerned with reconstructing precipitation and temperature as major climatic factors.[4]

Wood grows annual layer upon annual layer. To avoid confusion, the age of a sample is usually defined as the absolute age of the outermost ring preserved in the sample. If this ring is the last grown before the death of the tree (the so-called waney edge, in some cases preserved with bark), it is possible to date the cutting year and to identify the cutting season. Problems can arise from samples of wood in secondary use or from undetected repairs, for they may give a false higher or lower age, respectively, for their context.

Dendrochronology in Egypt and the Near East

The wood species to be investigated depend on their occurrence in the objects available for investigation and their suitability for this special method. Wood species analyses on Egyptian objects have been carried out on coffins and other objects in the British Museum,[5] on statues, wooden toilette objects, musical instruments and objects from the Coptic period in the Louvre,[6] and on various objects in the Munich collection.[7]

[4] F. H. Schweingruber, *Tree Rings. Basics and Application of Dendrochronology* (Dordrecht, 1988).

[5] W. V. Davies, "Ancient Egyptian Timber Imports. An Analysis of Wooden Coffins in the British Museum", in: W. V. Davies & L. Schofield, eds., *Egypt, the Aegean and the Levant. Interconnections in the Second Millennium BC* (London, 1995).

[6] A. Nibbi, *Ancient Egypt and Some Eastern Neighbours* (New Jersey, 1981).

[7] D. Grosser et al., "Holz—ein wichtiger Werkstoff im Alten Ägypten", in: S. Schoske et al., eds., *Anch—Blumen für das Leben. Schriften aus der ägyptischen Sammlung,* Heft 6, Staatliche Sammlung ägyptischer Kunst (München, 1992).

Table III. 3.1

Type of Wood	Nibbi 1981 Louvre	Grosser 1992 Munich and others	Davies 1995 British Museum
Ficus sycomorus	32	138	230
Tamarix sp.	> 100	106	158
Acacia sp.	35	42	53
Cedrus sp.	5 (7)	44	88
Juniperus sp.	2	10	16
Pinus sp.	9	3	37
Cupressus sp.	–	2	7

Table III. 3.1 provides a rough idea of the range of wood species used in ancient Egypt for various purposes. Unfortunately the majority of these species grow in Egypt (Ficus sycomorus, Tamarix sp., Acacia sp.) and since they do not form distinct ring borders, they are unsuitable for dendrochronological analysis. Only the gymnosperms can be used: *Cedrus libani* grows in Mediterranean mountain climate and has distinct ring borders. Its growth age is said to be as much as 500 years. Due to over-deforestation there are only a few small areas where it grows today in Lebanon, larger ones in Turkey (Taurus, Antitaurus), and in Syria. The sub-species *Cedrus libani atlantica* grows in the Atlas Mountains of Algeria and Morocco, *Cedrus libani brevifolia* in a very limited area in the mountains of the island of Cyprus. There are no anatomical features that distinguish these three sub-species of cedrus.

Cedar was imported to Egypt from the time of the Old Kingdom. Different interpretations of Egyptian texts mentioning imports of wood from certain countries, continue to fuel a heated debate about the origin of cedar found in Egypt.[8] Another contentious issue is the correct translation of different hieroglyphic terms obviously characterizing different species of wood.

Nili Lipschitz carried out wood species analysis and dendrochronological investigations on several historical and archaeological sites in Israel.[9] She worked with wood of Cedrus libani, Cupressus semper-

[8] Davies (n. 5); R. Meiggs, *Trees and Timber in the Ancient Mediterranean World* (Oxford 1982); Grosser et al. (n. 7); Nibbi (n. 6); idem, "Some Remarks on the Lexicon Entry: Zeder, Cedar", *DE* 7 (1987), 13–27.

[9] N. Lipschitz, "Overview of the Dendrochronological and Dendroarchaeological Research in Israel", *Dendrochronologia* 4 (1986), 37–58.

virens, Pinus nigra, Quercus cerris and Pistacia khinjuk. Dating the roof beams of the El-Aqsa mosque in Jerusalem produced a 231 year floating chronology with 14-C dates of the Byzantine period.[10]

The Aegean Dendrochronology Project (directed by Peter I. Kuniholm) is working on many archaeological sites in Turkey, Greece, and Italy. In the International Treering Data Base, standards for the 2nd millennium AD from Turkish forests are published for Cedrus libani, Juniperus sp., Quercus conferta, Pinus nigra, Pinus sylvestris and Abies nordmanniana.[11] A floating chronology for Bronze Age and Iron Age by 14-C wiggle matching is based on data for different tree species.[12,13]

Fritz Schweingruber published several modern standards for Cedrus libani brevifolia from Cyprus in the International Treering Data Base. A dendrochronological attempt at dating for Egypt continues/is carried out within the long-term scientific project "The Synchronization of Civilizations in the Eastern Mediterranean in the Second Millennium BC" at the dendrolab of VIAS, University of Vienna. The dendrochronological investigations try to develop a dating approach independent of other archaeological and scientific methods.[14] First results are a 507 year floating Cedrus libani chronology for the 2nd millennium BC, and several shorter floating chronologies. To date this chronology includes/subsumes the coffin of Sebekhetepi, the inner coffin of Gua, and a canopic box (British Museum, London); the garden model of Meketre (Metropolitan Museum of Art, New York); the coffins of Ashait, Djehutinakht, Khnumhotep, Neferi, the outer coffins of Amenemhat and Mesehti, and the shrine of Auibre Hor (Egyptian Museum, Cairo).

Wood samples from modern trees (Besharre, Barouk, Horsh Ehden) and from several buildings from Deir el Kamar and Qadisha valley (Lebanon) cover the centuries back to 1369 AD for further construction of a standard for absolute dating. Analysis of Bronze age charcoal

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[10] S. Lev-Yadun, "The Origin of the Cedar Beams from Al-Aqsa Mosque: Botanical, Historical and Archaeological Evidence", *Levant* 24 (1992), 201–208.

[11] http://www.ncdc.noaa.gov/paleo/ftp-treering.html

[12] P. I. Kuniholm, "A Date-List for Bronze Age and Iron Age Monuments based on combined Dendrochronological and Radiocarbon Evidence", in: M. J. Mellink, ed., *Aspects of Art and Iconography: Anatolia and Its Neighbors. Studies in Honor of Nimet Özgüç* (Ankara, 1993), 371–373. Idem et al., "Anatolian tree rings and the absolute chronology of the eastern Mediterranean, 2220–718 BC", *Nature* 381 (1996), 780–783.

[13] S. Manning et al., "Anatolian Tree Rings and a New Chronology for the East Mediterranean Bronze-Iron Ages", *Science* 294 (2001), 2532–2535.

[14] O. Cichocki, "Cèdres libanais comme instrument de datation en Egypte", *Proceedings of the 31CAANE Conference 2002*; in press.

samples from Arqa (Lebanon), Qatna, and Ebla (Syria) will enable testing of the standard for the 2nd millenium BC with 14C and should aid in determining whether Cedar wood was imported from Mount Lebanon or from other forests.

Dendroclimatology studies the impact of climate on trees through patterns of growth. As different factors (moisture, temperature, length of vegetation period) interact in a very complex system, the investigated parameters (ring width, early wood/late wood ratio, density) contain a varying mean of signals. Investigations in the Near East carried out by a team lead by Ramzi Touchan reconstructed precipitation for southern Jordan. Currently this project has expanded to take in Turkey, Lebanon, and Syria.[15] Knowledge about climate impact on ancient economies may aid analyses of political crises or warfare, which in turn influenced wealth and long-distance trade.

[15] R. Touchan, D. Meko & M. K. Hughes, "A 396-Year Reconstruction of Precipitation in Southern Jordan", *Journal of the American Water Resources Association* 35(1) (1998), 49–59.

III. 4 DATES RELATING TO SEASONAL PHENOMENA AND MISCELLANEOUS ASTRONOMICAL DATES

Rolf Krauss

The rising and falling of the Nile and the harvesting of grain and fruit occur regularly at certain times within the solar year. When their dates were recorded in terms of the Egyptian calendar, they can be converted into absolute dates. Occasions of quarrying expeditions have also been traditionally considered examples of seasonal dates, since Egyptologists conjectured that such work was not undertaken during the summer.[1] Even if so, the conversions yield intervals that are too broad to be of much use for chronology. For if cool weather lasts for 120 days, from November to February, then a "cool season date" spans an interval of 4 × 120 years = 480 years. Although there might have been a tendency to send expeditions to quarries during the cooler months, there are nevertheless attestations for expeditions at the hottest time of the year.[2] Thus conversion of expedition dates can result in chronological contradictions.

Dates of the Nile Flood

The Nile flood results principally from monsoon rains that fall over the Ethiopian plateau between mid-May and September.[3] In modern times the dams constructed at Aswan beginning around 1900 have prevented the annual flooding of the Nile Valley. Data recorded in the 19th century and the Middle Ages provide information about the onset and duration of the flood which are crucial for evaluating pharaonic dates. The Nile sunk to its lowest level in April/May; towards the end of

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[1] Meyer, *Chronologie*, 177–178; idem, *Nachträge*, 20; C. J. Eyre, "Work and organization of work in the Old Kingdom", in: M. A. Powell, ed., *Labor in the Ancient Near East* (New Haven, Connecticut, 1987), 16.

[2] Beckerath, *Chronologie*, 53.

[3] W. Willcocks, *Egyptian Irrigation* (London, 1889), 10.

May and the beginning of June it began to rise. The biography of Weni, a Dyn. 6 official, seems to mention a low water date.[4] Weni reports that he brought an altar from Hatnub to the pyramid of Merenreʿ within 17 days in III Shemu, "although there was no water on the *ṯzw*". Lieblein, who dated Merenreʿ far too early at ca. 2525 BC,[5] calculated that III Shemu 17 corresponded to March 5 Greg.,[6] a time when the river falls fast. Gardiner paraphrased Weni's description with "when the river was at its lowest".[7] If so, Merenreʿ would have reigned between ca. 2817 and 2694 BC when III Shemu 30 coincided with May 31 (Greg.) and III Shemu 1 with April 1 (Greg.). Following Gardiner and using the standard chronology for the OK, Eyre correctly calculated the Gregorian months December and January as corresponding to III Shemu,[8] but he wrongly designated these months as "a time of low, if not the lowest, water".[9] There are various possibilities to resolve the contradictions in Weni's report: the translation of *ṯzw* as sandbanks may be wrong;[10] the flood might have been low and run off very early that year; Weni may even have exaggerated.

Another low water date refers to a difficult passage through the channels of the Semna rapids at Uronarti in 19 Senwosret III.[11] Correlated with the Dal inscription of year 10 of Senwosret III, the Uronarti inscription "provides evidence for an extraordinary variability in the Nile levels of late winter during the reign of Senwosret III".[12] Seasonal dates that diverge from the statistical mean cannot be used to establish absolute chronology. In the following paragraphs the basic data are presumed to be samples of the statistical mean.

64 Gregorian maximum flood dates on record from the Middle Ages and the 19th and early 20th centuries refer to the Nile gauge at Roda (Old Cairo), whereas the pharaonic high flood dates refer to Karnak temple. At Roda the maximum height was reached between September

[4] *Urk.* I, 108.—Meyer, *Chronologie*, 178; *Nachträge*, 20 n. 1.

[5] J. Lieblein, "Eine chronologische Bestimmung", *ZÄS* 44 (1907), 101–102.—Cf. Borchardt, *Mittel*, 89 n. 3, for a similar approach.

[6] The correct correspondance of III Shemu 17 in 2525 BC is March 7 Greg.

[7] Gardiner, *Egypt*, 97.

[8] If Merenreʿ reigned in ca. 2222 ± 6 BC, then III Shemu corresponded in his reign to ca. December 8 to January 7 (Greg.).

[9] Eyre (n. 1), 16.

[10] Cf. J. Vandier, *La Famine dans l'Egypte ancienne* (Cairo: RAPH 7, 1936), 74–77.

[11] Borchardt, *Mittel*, 91.

[12] B. Bell, *AJA* 79 (1975), 238.

25 and October 5.[13] The earliest maximum date is August 14 and the latest October 27. Using Borchardt's incomplete Nile flood data, Beckerath presumed that the maximum occurred at Roda as early as August 25 and as late as October 27, but 4 days earlier at Luxor.[14] For the latter, Borchardt relied on the fact that in 1925 the maximum travelled from Luxor to Roda within 4 days.[15] However, the speed differed considerably in other years: "The Nile at Assuân reaches its maximum about the 5th September, and would under ordinary circumstances be at its highest in Lower Egypt about the 11th September, but as the basins of Upper Egypt are being filled in August and September, and emptied in October, the maximum in Lower Egypt is ordinarily about the 10th October."[16] The delay apparently resulted from interaction between the filling of the irrigation basins and the size of the flood. For example, in 1887 the Nile reached its maximum at Aswan on September 1, at Armant on September 6, and at Roda on September 25.[17] In that case 19 days elapsed between maxima at Luxor and Roda, instead of 4 days as Borchardt had presumed.

Application of the 19th century flood data for Roda to the pharaonic period presupposes a comparable irrigation system. Irrigation works of some kind are first attested in the FIP,[18] but very little information survives for later pharaonic history. There is no indication that a fully developed system of basin irrigation existed in the NK or even earlier. Under these circumstances it is preferable to use the maximum flood dates of Aswan, instead of Roda, when calculating dates for the Luxor region. The maximum required was at most 4 days for the distance Aswan: Luxor.[19] There are 34 maximum dates for Aswan on record;[20] the earliest is August 18, the latest October 1, yielding maximum dates for Luxor between August 21/22 and October 4/5. Based on a comparison of the dates at Aswan and Roda, it follows that the maximum

[13] W. Popper, *The Cairo Nilometer* (Berkeley, 1951), 87–88.
[14] Borchardt, *Annalen*, 7; Borchardt, *Mittel*, 90; Beckerath, *Chronologie*, 52.
[15] Borchardt, *Mittel*, 90 n. 5.
[16] Willcocks (n. 3), 10.
[17] Willcocks (n. 3), 31, 184–185.
[18] E. Endesfelder, "Zur Frage der Bewässerung im pharaonischen Ägypten", ZÄS 106 (1979), 37–51; W. Schenkel, *Die Bewässerungsrevolution im Alten Ägypten* (Mainz, 1978), 35–36.
[19] For varying velocities of the Nile, see W. Willcocks, *Egyptian Irrigation*^{2} (London, 1913), 143–144.
[20] H. G. Lyons, *The Physiography of the River Nile and its Basin* (Cairo, 1906), 289–290.

gauge occurred between 4 days (1882) and 63 days (1894) at Roda later than at Aswan.[21] Borchardt's Roda-based maximum dates for Luxor tend to be much too late, yielding an interval of ca. 4 × 64 years = 256 years for a pharaonic maximum date. By contrast, the Aswan-based interval for maximum dates at Luxor results in a period of ca. 4 × 45 years = 180 years. Records for only three events at high flood are preserved:

(1) Sebekhotep VIII, Epagomenae of year 4: flooding of Karnak temple.[22]
(2) Osorkon III, year 3, III Peret 22:[23] flooding of Karnak temple.
(3) Shebitku, year 3, I Shemu 5: royal visit to Karnak temple after a high flood.[24]

(1) Provided Sebekhotep VIII ruled ca. 1600±150 years, then August 22 (Greg.) corresponds to September 5 (Jul.) and October 5 (Greg.) to October 19 (Jul.). These Julian dates correspond to the E(pagomenae) as follows:

E 1 = Oct 19 Jul in 1709/06 BC	E 1 = Sept 5 Jul. in 1532/29 BC
E 5 = Oct 19 Jul in 1693/90 BC	E 5 = Sept 5 Jul. in 1516/13 BC

The flood in 4 Sobekhotep VIII occurred, then, between 1709 and 1513 BC; the mean year is 1611 BC. By contrast, Beckerath obtained the limits 1869 and 1534 BC and the mean year 1701 BC.

(2) Provided Osorkon III ruled around 700 BC, then August 22 (Greg.) corresponds to August 29 (Jul.) and October 5 (Greg.) to October 13 (Jul.). The Julian dates for III peret 22 are:

III peret 22 = October 13 (Jul.) in 861/858 BC
III Peret 22 = Aug 29 in 681/678 BC

[21] For the maxmimum dates at Roda see Lyons (n. 20) 321 and M. Clerget, *Le Caire* I (Cairo, 1934), 44 (correct "1880 août" to "1880 septembre").

[22] L. Habachi, *SAK* 1 (1974), 207–214; J. Baines, *Acta Orientalia* 36 (1974), 39–54; idem, *Acta Orientalia* 37 (1976), 11–20.

[23] Reading after Schott; see Borchardt, *Mittel*, 91.

[24] J.v. Beckerath, *JARCE* 5 (1966), 53; idem, *GM* 136 (1993), 7; idem, *Chronologie* 92, 52.

Therefore the flood in 3 Osorkon III occurred between 861 and 678 BC; the mean year being 770 BC.[25] By contrast, Beckerath obtained the limits 932 and 677 BC and 805 BC as the mean year.

(3) The text that relates to Shebitku's appearance in Karnak mentions the Nile level "of his time (*m hʿw.f*)". Borchardt interpreted the visit as coincidental with a maximum flood whose occurrence was slightly delayed.[26] He conceded that the maximum flood could have occurred before the king's visit. I Shemu 5 corresponded to October 9 (Greg.) in 705 BC = 3 Shebitku.[27] It cannot be excluded that the visit coincided with a much delayed maximum flood, although more probably the maximum occurred earlier, in September.

Opening of the Basin Canals in the Theban Area?

Ramesside graffiti record dates when "this day, the water returned/came to inundation"[28] which were thought to refer to the falling of the flood or the feast "night of the drop" or the onset of the flood.[29] More recently Janssen believes the dates to refer to the opening of the basin canals that took place in the 19th century around August 12. He supposes that "the situation in Pharaonic times was not essentially different than in the nineteenth century AD," and that the Ramesside flood dates also fell around August 12 (Greg.).[30] Beckerath presumes that the dams were opened depending on the height of the flood, with the mean August 12 (Greg.).[31] Both authors overlook the recorded indiviual dates for the opening of basin canals in the 19th century. In Kena province, and thus at Luxor, the dates deviated from August 12 by +3 days and −6 days at most.[32] August 12 was a deadline set by the Khedive that

[25] Borchardt, *Mittel* 91 n. 6, noted that the day coincided with a procession of Amun (line 5 of the text); he expected a full moon. He may have been correct coincidentally, if the *Tepi Shemu* date I Shemu 6, year 18 (Fitzwilliam 68d) is correctly ascribed to Osorkon III as Kruchten, *Annales*, 144, 240 suggests.

[26] Borchardt, *Mittel*, 91.

[27] Cf. above Jansen-Winkeln, Chapter II. 10, and Zibelius-Chen, Chapter II. 12.

[28] J. J. Janssen, *JNES* 46 (1987), 125–136.

[29] Meyer, *Nachträge*, 39–42; with additional literature.

[30] Janssen (n. 28).

[31] Beckerath, *Chronologie*, 52.

[32] Willcocks (n. 19), 335.

could be missed if a harvest of sorghum was imminent in a basin.[33] The interpretations of Janssen and Beckerath presuppose that the system of basin irrigation existed already in Ramesside times and was managed as in the 19th century. No NK sources support this idea. The Ramesside flood dates may refer instead to the flooding of the valley after the Nile had breached the levees.

Grain Harvesting Dates

Ploughing and sowing were done as soon as the flood had receded. According to one MK source, the fields were measured for tax assessment when the seed had sprouted,[34] whereas NK sources seem to indicate the measuring of ripening fields.[35] Thus the measuring of fields cannot be used to establish absolute chronology.

Traditionally, Egyptologists assumed that barley was harvested between the end of February and the beginning of March (Greg.), and wheat in April (Greg.).[36] By contrast, in pharaonic times the harvest could have began as early as February and ended as late as in May (Greg.).[37] The delivery of grain occurred later, after time-consuming threshing,[38] winnowing, and cleaning.[39] Most references to collection and delivery of grain are Ramesside and date to summer and fall months (Greg.);[40] they are only suited for a rough determination of Ramesside chronology.[41] By contrast, the correct harvest date is crucial for the hypothetical coregency of Thutmose III with Amenhotep II.[42]

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[33] Willcocks (n. 19), 38 (304).

[34] P. Smither, *JEA* 27 (1941), 74–76.—R. Krauss, "Detailfragen der altägyptischen Getreidewirtschaft", in: *Form und Mass. Fs für Gerhard Fecht*, J. Osing & G. Dreyer (eds.), (Wiesbaden, 1987), 268–269.

[35] Cf. J. J. Janssen, *BiOr* 49 (1986), 356, and W. Helck, *LÄ* II, 152–153.

[36] Cf. for example, Beckerath, *Chronologie*, 53.

[37] R. Krauss, "März, April und Mai als durchschnittliche Monate der Getreideernte im antiken und neuzeitlichen Ägypten" *DE* 27 (1993), 27–34

[38] For threshing dates as late as August/September (Greg.), see Krauss (n. 37).

[39] H. Felber, "Die Daten in den demotischen Ackerpachtverträgen der Ptolemäerzeit und das landwirtschaftliche Jahr", *APF*, Beiheft 3 (1997), 281–289.

[40] For example, pTurin 1895+2006 lists collection dates between May 29 and September 4 (Greg.); cf. A. H. Gardiner, *JEA* 27 (1941), 22–37.

[41] Beckerath, *Chronologie*, 53.

[42] Cf. above Hornung, Chapter II. 8, and below Krauss, Chapter III. 8.

Wine Delivery Dates

Since the Middle Ages and down to the present, grapes ripen in Egypt towards the end of June;[43] vintaging and wine-making occurred in August (Greg.).[44] If the same conditions prevailed in the NK, the sealing of the wine jars would have taken place after fermentation towards the end of August/beginning of September (Greg.).[45] Jar labels mention the regnal year of the sealing; the month is very seldom cited.[46] The labels name the chief vintner and the wine estate, but not the ruling king. Great quantities of dated wine jars were excavated at Malqata[47] and Amarna, at the Ramesseum,[48] and in Deir el-Medina.[49] At Amarna wine jar labels of 1+16 successive vintages were found. The labels document the later part of Akhenaten's reign, and the reigns of two successors.[50]

A wine jar from the funerary temple of Amenhotep II bears the date "regnal year 26".[51] If the year is ascribed to Amenhotep II, then the sealing of the jar took place in ca. II Akhet,[52] 10 months after the beginning of year regnal 26.[53] It may be surmised that the reign of 25 y + 10 m that Manetho (Flavius Josephus) ascribes to Mephramuthoses, the precursor of Thmosis < Thutmose IV, belongs to Amenhotep II.

Harvesting of Flax

In the tomb of the nomarch Djehutinakht (Bersheh 1), a scene of harvesting flax is dated to IV Akhet 23.[54] The nomarch is datable to around year 31 of Senwosret I.[55] Meyer[56] and then Borchardt[57] relied

[43] Krauss, *SAK* 23 (1996), 237 n. 67.
[44] C. Pellat, *Cinq calendriers égyptiens* (Cairo, 1986), 247, s.v. vin.
[45] R. Krauss, *MDOG* 129 (1997), 227; idem, *SAK* 23 (1996), 238–239; with additional literature.
[46] Cf. Hornung, *Untersuchungen*, 78 n. 51.
[47] W. C. Hayes, *JNES* 10 (1951), 41–56.
[48] W. Spiegelberg, *ZÄS* 58 (1923), 25–36; Beckerath, *Chronologie NR*, 40.
[49] Beckerath, *Chronologie NR*, 40.
[50] See above Hornung, Chapter II. 8.
[51] *Urk.* IV, 1365; Beckerath, *Chronologie NR*, 94; idem, *Chronologie*, 109.
[52] II Akhet 1 = September 9 Jul. = August 26 Greg., in 1400 BC.
[53] See above Hornung, Chapter II. 8.
[54] *PM* IV, 177.
[55] H. G. Fischer, *LÄ* II (1977), 414.
[56] Meyer, *Nachträge*, 189–20.
[57] Borchardt, *Mittel*, 89–90.

on information in the *Description de l'Égypte* that flax harvesting took place in the region of Asyut at the beginning of April and lasted 8 to 10 days. But rather than this isolated date, the general date for flax harvesting in Egypt should be used, viz. March to April.[58] Furthermore, the date is not necessarily contemporaneous with Djehutinakht, for the scene with its date could have been copied from another earlier tomb. IV akhet 23 corresponds to March 15 Greg. = March 31 Jul. in 1893/1890 BC and to April 15 Greg. = May 2 Jul. in 2021/2018 BC. Harvesting of flax as early as March 15 Greg. or later is compatible with the low chronology (Senwosret I reigned 1920–1875 BC), but also with a slightly higher one.

Seasonal Finds in the Tomb of Tutʿankhamun

Provided the times of flowering and ripening are known and if the material did not come from storage, the season when plant material was deposited in a tomb can be determined in terms of the Egyptian calendar. By far the most important example is the tomb of Tutʿankhamun with its great diversity of plant remains. The flowers that were used in the wreaths (Picris asplenoides L., Centaurea depressa, Whitania somnifera (L.) and Nymphaea caerulea Sav.) blossom in April; the Christthorn fruit (Zizyphus spina Christi), of which great quantities were found, also ripens in April. The absence of oil seed and fruit common in other tombs, which was harvested in the summer months (Balanites Aegyptiaca, Ricinus communis; Cyperus esculentus, Punica granatum and Ficus carica), indicates that the burial took place when these fruits were already used up. Thus it is to be concluded that the burial took place in April (Greg.).[59] Provided the burial followed a regular mummification process of 70 days, the king would have died between January 21 (Greg.) and February 20 (Greg.). If he died in or ca. 1322 BC the interval corresponds to III peret 18/IV peret 18 which would also subsume the accession date of Aya, otherwise not known.[60]

[58] R. Krauss, *BSEG* 15 (1991), 79; with additional literature.

[59] P. E. Newberry, in: H. Carter, *The Tomb of Tutankhamen* II (London, 1927), 189–196; R. Germer, *Die Pflanzenmaterialien aus dem Grab des Tutanchamun* (Hildesheim: HÄB 28, 1989), 4–26; R. Krauss, "Nochmals die Bestattungszeit Tutanchamuns", *SAK* 23 (1996), 227–254.

[60] Cf. above Hornung, Chapter II. 8.

Tutʿankhamun's death in January/February raises an obstacle to his identification with Nipkhururia, who apparently died at the end of summer or early in the fall.[61]

Solar and Lunar Eclipses

There are no reports of solar and lunar eclipses from pharaonic Egypt. Thus ancient Egyptian data are absent in modern astronomical analysis of recorded eclipses.[62] A text from year 15 of Takelot II was thought to refer to a lunar eclipse. If the verb in question is understood as *sḏm.f*, then the translation is "the sky did not devour the moon",[63] if the form is interpreted as *n sḏmt.f*, then the translation is "before the sky swallowed the moon".[64] Regardless, it was already known in the 19th century that there was no lunar eclipse which would fit the standard chronology of the period;[65] it seems possible that the text refers to a delayed appearance of the new crescent.[66]

A solar or lunar eclipse supposedly occurred when Psammetichus I died.[67] The source is the Demotic papyrus Berlin 13588, written in late Ptolemaic or early Roman times.[68] The papyrus relates how a priest heard that the sky swallowed the disk (*jtn*) when Psammetichus I died; later the priest copied the "Book of Breathing" onto the mummy wrappings of Psammetichus I. The reported time of the supposed eclipse does not suit the solar eclipse of September 30, 610 BC; instead, it would fit the lunar eclipse of March 22, 610 BC. The context of the eclipse is fictitious, insofar as it would date the "Book of Breathing"—a creation of the Ptolemaic period—to the time immediately after the

[61] Cf. above Klinger, Chapter II. 13.

[62] Stephenson, *Eclipses*, 58–59, and J. M. Steele, *Observations and Predictions of Eclipse Times by Early Astronomers*, (Dordrecht, 2000), 6.

[63] Caminos, *Chronicle*, 88–89.

[64] K. Jansen-Winkeln, *SAK* 21 (1994), 127.

[65] Cf. Kitchen, *TIP*, 181–182; Beckerath, *Chronologie*, 41–42.

[66] R. Krauss, "Die Bubastiden-Finsternis im Licht von 150 Jahren Forschungsgeschichte", *MDAIK* 63 (2007), in press.

[67] O. Neugebauer, *The Exact Sciences in Antiquity*[2] (Providence, 1957) 95 n. 2; E. Hornung, *ZÄS* 92 (1966), 38–39; M. Smith, *OLP* 22 (1991), 101–109.

[68] W. Erichsen, "Eine neue demotische Erzählung", *Akademie der Wissenschaften und der Literatur Mainz*. Abhandlungen der geistes- und sozialwissenschaftlichen Klasse 1956, Nr. 2, 49–81.

death of Psammetichus I. An eclipse that is reported in a fictitious tale cannot be deemed historical.[69]

Eclipses that were recorded in the Near East such as the solar eclipse of 15 June 763 BC (see above Klinger, p. 308) are of indirect importance to Egyptian chronology. The solar omen of year 10 of Murshili II would be important for the chronology of the Amarna period and its aftermath, if it were indeed an eclipse. The text says that the sun god "gave an omen"; the kind of heavenly phenomenon (eclipse?) is open.[70]

Miscellaneous Astronomical Phenomena

The observations of the planets Mercury (Seth) and Venus (Horus, Eye of Horus) that are reflected in the Cairo "Calendar of lucky and unlucky Days" are datable to 1298/97 BC, whereas the manuscripts are at least 80 years younger.[71]

There are, for example, no Egyptian reports about periodic comets, singular Novae or occultations. Whether the "star miracle of Thutmose III" reflects an actual event or phantasy is moot.[72]

J. Herschel dated the Giza pyramids on the assumption that the orientation of the ascending corridors was determined by the position of the "polar star" at the time when the pyramids were laid out.[73] Herschel subsequently retracted his proposal and accepted the explanation that the angle of the corridors was chosen to facilitate their filling with large blocks after the burial of the pyramid's owner.[74] But this was overlooked by later astronomers and Egyptologists who criticized his original idea.[75]

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[69] Krauss (n. 66).

[70] Ph. van den Hout, *Purity of Kingship* (Leiden, 1998) 42ff.; D. Schwemer, in: *Die Hethiter und ihr Reich. Das Volk der 1000 Götter.* Exhibition catalogue (Stuttgart, 2002), 140–145, at 144.

[71] R. Krauss, "The Eye of Horus and the Planet Venus: Astronomical and Mythological References", in: *Under One Sky*, J. M. Steele & A. Imhausen, eds., (Münster: AOAT 297, 2002), 193–208.

[72] *Urk.* IV 1238; cf. D. Meeks, *LÄ* IV, 117–118.

[73] J. Herschel, *Outlines of Astrononomy*[6] (London, 1859), 205–207.

[74] M. Brück, *Journal of the British Astronomical Association* 105.4 (1995), 161–164.

[75] E.-M. Antoniadi, *L'astronomie égyptienne depuis les temps les plus reculés jusqu'à la fin de l'époque Alexandrine* (Paris, 1934), 146; J.-Ph. Lauer, *Le problème des pyramides d'Egypte* (Paris, 1952), 187–188.

According to a hypotheses proposed by K. Spence, the pyramids of Dyns. 4 and 5 were oriented towards north utilizing the "simultaneous transit method", i.e. projecting the chord joining two circumpolar stars on opposite sides of the celestial north pole at the moment of their respective upper and lower culmination.[76] In the course of decades and due to precession the method would yield first values east (west) of north, then true north, later values west (east) of north. If the method was applied in the 26th and 25th century BC to the stars Mizar (ζ UMa) and Kochab (β UMi), then the resulting pattern seems to fit known pyramid alignments.[77] But the orientation of Djedefre''s pyramid which became known in 2001,[78] does not fit into the sequence, and thus the hypothesis cannot be correct.[79]

Moreover, Spence presumes that it was the west sides of the pyramids which were astronomically aligned; in fact, the corridors on or parallel to the central axis are decidedly closer to true north than the west sides and it is likely that they were the features to be astronomically aligned. However, the orientation of the corridors does not adhere to a scheme that could have been related to precession and thus the pyramids cannot be dated by this means.[80]

Finally, it should be emphasized that the angles of the air shafts in the "Great Pyramid" (pyramid of Cheops) are useless for dating the structure astronomically.[81] Another senseless exercise involves using the presence or omission of certain planets in the representation of the astronomical ceiling in the tomb of Senenmut for dating purposes.[82]

[76] K. Spence, *Orientation in Ancient Egyptian Royal Architecture* (unpubl. Diss., Cambridge, 1997); idem, *Nature* 408 (2000), 320–324.

[77] Cf. J. A. Belmonte, "On the orientation of the Old Kingdom pyramids", *Archaeoastronomy* 26 (*JHA* XXXII) (2001), S1–S20.

[78] E. Aubourg & C. Higy, "Détermination de l'orientation de la pyramide de Rêdjédef", *BIFAO* 101 (2001), 457–459.

[79] Cf. also A.-A. Maravelia, "L'horizon astral de Khéops. Archéoastronomie, égyptologie . . . et quelques scénarios de science-fiction", Tôzai 5 (2000), 11–37.

[80] R. Krauss, "¿Las ilusiones perdidas? Recientes intentos en Arqueoastronomía en Egipto", BAEDE 16 (2006), in press.

[81] See R. Krauss, "Los canales en la pirámide de Kheops", BAEDE 13 (2003), 55–66, rejecting Brück (n. 74).

[82] As C. Leitz, Studien, 35ff. does; accepted by Beckerath, Chronologie NR, 94 n. 581; refuted by R. Krauss, *GM* 146 (1995), 61–70.—O.v. Spaeth, *Centaurus* 42 (2000), 159–179; countered by C. Leitz, *Centaurus* 44 (2002), 140–142.

III. 5 ASTRONOMY ON THE HORIZON AND DATING— A TOOL FOR ANCIENT EGYPTIAN CHRONOLOGY?

Juan Antonio Belmonte

Astronomy can offer a third dating option, over and above the analysis of lunar and Sothic dates, viz. the possibility of dating monuments using solar, lunar or stellar alignments depending upon the variation of stellar coordinates due to precession or the variation of ecliptic obliquity. For such analysis, astronomy on the horizon is the most relevant tool. The pioneering work in this area is Norman Lockyer's *The Dawn of Astronomy*,[1] considered today by some archaeoastronomers as the first "serious" book in their discipline. The author made ample use of precession to date Egyptian temples to support the long chronology which was accepted in his day (Dyn. 1, ca. 5000 BC). When Egyptologists discarded such chronologies any possibility of their using archaeoastronomy as a chronological tool disappeared with it. In the 1970s Gerald Hawkins[2] reopened the discussion; although the topic was promoted by Edwin Krupp,[3] there was no noticeable response from Egyptologists.

Astronomical alignments are either directed towards the horizon or towards lower zenithal distances, including alignments towards zenith pass. The latter has seldom figured in archaeoastronomical studies, although it has the advantage of offering fewer problems. But its existence is difficult to demonstrate, except in the case of zenith pass for which Mesoamerica furnishes several good examples, but Egypt none.[4]

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[1] J. N. Lockyer, *The Dawn of Astronomy* (London, 1894).

[2] See e.g. G. S. Hawkins, *Beyond Stonehenge* (New York, 1973); idem, "Astroarchaeology: The Unwritten Evidence", in: A. Aveni, ed., *Archaeo-astronomy in Precolombian America* (Austin, 1975), 131–162.

[3] E. C. Krupp, *In search of the Ancient Astronomers* (New York, 1977), 208–219; idem, "Egyptian Astronomy: Temples, Traditions, Tombs", in: *Archaeoastronomy and the Roots of Science*. AAAS Sym. 71 (Boulder, 1984); idem, *Beyond the Blue Horizon* (Oxford, 1991).

[4] For Mesoamerica, see A. F. Aveni, *Skywatchers of Ancient Mexico*^{2} (Austin, 1990); for a hypothetical use of zenith passage in Egypt, see J. A. Belmonte, "Some open questions on the Egyptian calendar: an astronomer's view", *Trabajos de Egiptología* 2 (2003), 7–56.

The controversial theories relying on simultaneous star transit to explain pyramid alignments for dating purposes exemplifies the problem.[5] Part of the "Cosmology of Nut" system, present in the tomb of Ramesses IV and the Osireon of Abydos, and the Ramesside clock devices in the tombs of Ramesses VI, VII and IX probably also related to stars in positions far from the horizon.[6]

Astronomy dealing with phenomena near the horizon includes heliacal risings (and settings) which are basic for the understanding of decanal star clocks.[7] However, in what follows I shall concentrate on possible stellar or (luni)solar alignments on or near the horizon as a means of dating pharaonic monuments.

In Fig. III. 5.1 there are three problems, two of atmospheric origin (refraction and extinction), and one of a topographic nature (rough horizon). In the case of (luni)solar observations, the size of the solar disc presents a fourth problem. The azimuth a of the rising or setting of a celestial object can be calculated in principle by using simple spherical trigonometry. Consequently, if a building were oriented with reference to a certain celestial body,[8] it might be possible to calculate the date of the building's foundation.

Simple spherical trigonometric calculations would apply only to a planet without atmosphere and with a flat surface. In reality, a celestial body is never seen rising or setting at a; Figure 1 illustrates the following actual possiblities:

a': The setting of the star, if only refraction is taken into account, e.g., at a flat desert horizon. This also varies because refraction is especially dependent on atmospheric conditions such as humidity, temperature,

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[5] K. Spence, "Ancient Egyptian Chronology and the Astronomical Orientation of Pyramids", *Nature* 408 (2000), 320–324.—Challenged by A. A. Maravelia, "L'horizon astral de Khéops", *Tozai* 5 (2000), 11–37, and J. A. Belmonte, "On the orientation of the Old Kingdom pyramids", *Archaeoastronomy Supplement, JHA* 26 (2001), S1–S20.

[6] See C. Leitz, *Altägyptische Sternuhren* (Louvain: OLA 62, 1995); J. A. Belmonte, "The Ramesside star clocks and the ancient Egyptian constellations", in: *Calendars, symbols and orientations: legacies of astronomy in culture, Proceedings of the SEAC 9th Annual Meeting, Uppsala Astronomical Observatory Report* 59 (2003), 57–65.

[7] On the decans see J. A. Belmonte, "The decans and the ancient Egyptian skylore: an astronomer's approach", *Proceedings of the INSAP III Meeting*; *Memorie della Societa Astronomica Italiana 63 (2001), special vol. I, 43–57.*

[8] See e.g., Leitz' controversial *Studien*, and J. A. Belmonte, *JHA* 26 (2001), S1–S20. See also the only slightly outdated study of Z. Zaba, *L'orientation astronomique dans l'ancienne Égypte, et la précession de l'axe du monde* (Prague: Archiv Orientální Suppl. 2, 1953).

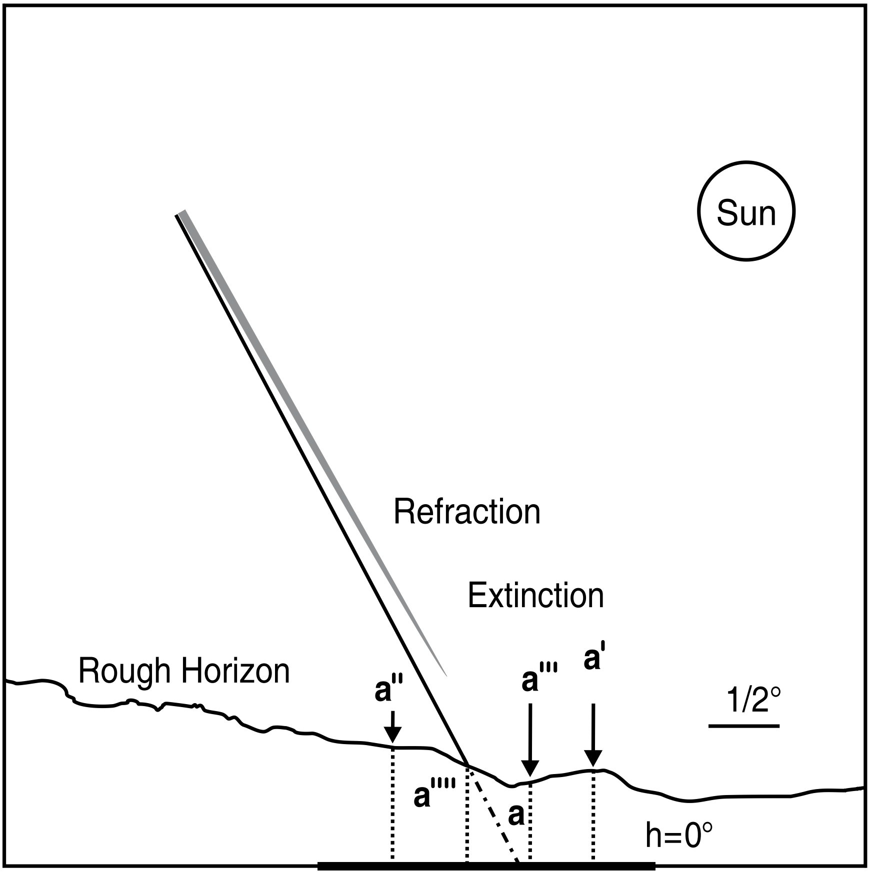


Figure III. 5.1: Real setting track (black) of a celestial object (here: Venus) under extreme atmospheric conditions. (On the basis of a photograph taken on southern Tenerife, Canary Islands, Lat. 29º.) Compare the theoretical astronomical setting azimuth a to the actual azimuth at last visibility of the star at a or the azimuth under ideal atmospheric conditions only affected by low refraction and rough horizon a'''. The theoretical star track is in white; topographical features and size of the sun disk are at the same scale; the slightly elliptical shape of the disk is due to refraction.

and the presence of dust or haze near the horizon, an extremely frequent occurrence in Egypt.

a'': The azimuth of the actual last visibility of the star is due not only to refraction but particularly to atmospheric extinction. According to a rule of thumb, a star becomes visible above the horizon, if its angular height is at least equal to its magnitude. Accordingly, under the best circumstances only Sirius, Vega, Rigil Kentaurus or Arcturus,

or the brightest planets, would be visible at 0^{o} altitude. However, this too, is very dependent on atmospheric conditions; dust clouds ("calimas") or haze can severely affect visibility. In particular, Figure 1 represents a setting of Venus in southern Tenerife when the planet had the magnitude minus 2. However, sighting of Venus was lost when it was still more than 2^{o} above the horizon. It was a dusty day, as often occurs at Saharan latitudes like the Canary Islands or Egypt.

a''': Setting azimuth of the star taking into account refraction and rough horizon. This would have been the actual setting azimuth of Venus on this occasion, provided the atmosphere would have been much clearer and more stable on that night.

a'''': Theoretical setting azimuth considering only rough horizon and no atmosphere. This value is obtained from standard azimuth (a_{mes}) and height (h_{mes}), with measurements taken either with a theodolite or a tandem when aligning a specific structure. For the sun or the moon, one should consider, apart from parallax, the size and shape of the disc (the latter dependent also on refraction and extinction) which at a rough horizon, can substantially change the position of the last contact event (or first contact for rising), and, consequently, the alignment of a building.

On this basis I can affirm without reservations that a precision of $\frac{1}{2}^{o}$ in determination of azimuth is perhaps the best one can expect for solar or very bright star observations near the horizon in Egyptian latitudes. For fainter stars, like those of the Foreleg (*msẖtyw*) or Orion (*sꜣḥ*), or important asterisms, like the Pleiades (*ẖꜣw*), the error in azimuth can range between one and several degrees of arc.[9] Because of this variation, Haack's theory of pyramid orientation was not taken seriously and his discovery of the error versus time trend ignored.[10] For the same reason Isler[11] and Edwards[12] were forced to abandon horizontal astronomy in favor of a cast shadow system or an artificial horizon, respectively.

[9] See the figures in J. A. Belmonte & M. Hoskin, *Reflejo del Cosmos: Atlas de Arqueoastronomía del Mediterráneo Antiguo* (Madrid, 2002), 25. They are based on R. M. Sinclair & A. Sofaer, "A method for determining limits on the accuracy of naked-eye locations of astronomical events", in C. L. N. Ruggles, ed., *Archaeoastronomy in the 1990s* (Loughborough, 1993). See also B. E. Schaefer, "Atmospheric extinction effects on stellar alignments", *Archaeoastronomy Supplement JHA* 10 (1986), S32–S42.

[10] S. C. Haack, "The Astronomical orientation of the Egyptian Pyramids", *Archaeoastronomy Supplement, JHA* 7 (1984), S119.

[11] M. Isler, "An ancient method of finding and extending direction", *JARCE* 26 (1989), 191–206.

[12] I. E. S. Edwards, *The Pyramids of Egypt*[3] (Harmondsworth, 1993).

Does this mean that astronomical alignments are completely useless for chronological issues? The answer is yes and no. A recent study by Gabolde[13] illustrates the problem for a solar alignment. There is general agreement that Amun's temple at Karnak was aligned towards the rising sun on a winter solstice.[14] However, Gabolde's attempt to fix the date as the winter solstice following July 27 in 1946 BC, during the reign of Senwosret I, for laying the temple axis should be viewed with extreme caution. The change of solar declination due to variation of ecliptic obliquity is of the order of only 0".46 per year. Therefore the change of ½° occurs only after 3900 years, which is approximately the time elapsed between Senwosret I and the present. Thus the minimum error equals the variation, making dating tenuous.[15] Either those who set the axis were extremely good topographers and precise technicians working under perfect atmospheric conditions, or I should conclude that we are faced with a very lucky situation, one in which fine calendrical determination and timing, splendid weather and the technical skill of ancient Egyptians conspired to yield an almost perfect alignment. If standard chronology did not support this epoch, I would have never been confident about fixing the date of Senwosret I's tenth regnal year just using solar alignment.

For stars, the situation is different. Precession can substantially change the coordinates of a certain star and thus its rising and setting azimuths or, in general, its position in relation to the local horizon (e.g. angular height and moment of culmination). Sirius is exemplary for the case of horizontal astronomy. Between 3000 BC and 500 AD, the declination of Sirius changed from −22°.7 to −15°.8 and its rising azimuth changed from 116½° to 108⅓° for the latitude of Cairo (30°). The rising azimuth would change from 115° to 107⅓° for the latitude of Philae or Aswan (nearly 24°), where important temples of Isis or Satet were located, the divinities who manifest themselves in Sirius.[16] Presuming

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[13] L. Gabolde, *Le "Grand Château d'Amon" de Sésostris Ier à Karnak* (Paris: MAIBL, N.S. 17, 1998), 123–137.

[14] For this controversial topic, see M. Shaltout & J. A. Belmonte, "On the orientation of ancient Egyptian temples: (1) Upper Egypt and Lower Nubia", *JHA* 36 (2005), 273–298, with references; for a different view see R. Krauss, "¿Las ilusiones perdidas? Recientes intentos en Arqueoastronomía en Egipto", *BAEDE* 16 (2006), in press.

[15] According to my personal impression the foundation blocks of the original MK temple do not permit a much better precision even with the use of a theodolite.

[16] See R. A. Wells *SAK* 12 (1985), 255–302, for a study of the orientation of the Satet temple at Elephantine with reference to Sirius.

an error of ½°, we can obtain a precision on average of nearly a quarter of a millennium or, under excellent atmospheric conditions, perhaps a little better. Obviously, the azimuth dating device is not very precise, but not useless. If there is textual evidence, as, for instance, in Dendera and perhaps in Philae, we might be able to date alignments to Sirius within some centuries.

In the case of fainter stars their coordinate variation and their magnitudes are decisive, but, in general, the results are less reliable than for Sirius.[17] Consequently, for other stars or planets, such us the bright stars of the Foreleg, and for other epochs, we can make estimates perhaps to the nearest century in the best cases, even though, on some occasions, we might be very lucky, as in the example of Karnak.

Astronomy near the horizon cannot be used as an appropriate, and certainly not as a definitive tool by itself for establishing the precise parameters of pharaonic chronology. However, the approach is useful nevertheless, for it provides insights into the role of astronomy within the culture of ancient Egypt, particularly in the religious sphere.[18]

[17] Except for stars where precession can produce a substantial change in coordinates. Alnilan (ε Ori), the central star of the *sꜣḥ* constellation, is a good example; its declination changed from –17°.3 in 3000 BC to –3°.4 in 500 AD. A still better example is Arcturus (probably to be identified as a bright star of the constellation *mnjt*), which changed from 48°.6 to 27°.6 in the same period. In these cases, ½° error in azimuth would permit a precision of 110 and 60 years, respectively, for the latitude of Cairo.

[18] See, for example, G. de Young, "Astronomy in Ancient Egypt", in: H. Selin, ed., *Astronomy across Cultures* (Amsterdam, 2000), 475–508; J. A. Belmonte, "Astronomía y arquitectura: el papel de los astros en la cultura y el arte del antiguo Egipto", in M. A. Molinero & D. Sola, eds., *Arte y Sociedad del Antiguo Egipto* (Madrid, 2000), 109–136.

III. 6 LUNAR DAYS, LUNAR MONTHS, AND THE QUESTION OF THE 'CIVIL-BASED' LUNAR CALENDAR

Rolf Krauss

The Days of the Lunar Month

The ancient Egyptians observed the phases of the moon; they counted and named the days of the lunar month as well. Early on Brugsch compiled a list of the names of the lunar days; they are readily accessible in Parkers's *Calendars*.[1]

The earliest attestations for lunar days occur in private and royal inscriptions of Dyns. 4 and 5. The Palermo stone preserves the earliest royal example: LD 6 = *snwt*, a day of offering at Heliopolis in regnal year 6 of Weserkaf.[2] The lunar days *psḏntyw*, *ꜣbd*, *snwt*, *dnjt* and *smdt*, i.e. LD 1, 2, 6, 7 and 15 are attested as days of rituals in the Pyramid Texts.[3] Spalinger has collected and analysed the private feast lists of all periods.[4] The early lists mention the lunar days *ꜣbd* and *smdt* as well as *sꜣḏ*,[5] but not *psḏntyw*. As Spalinger notes, "when one descends in time from the Old Kingdom to the very last phases of Pharaonic civilization, the number of lunar-based feasts diminishes".[6] But lunar days are attested throughout Egyptian history and can be utilized for chronological analysis, if they are combined with dates of the civil calendar.[7]

[1] Parker, *Calendars*, 11–12; cf. also Belmonte, "Questions", 35.
[2] Wilkinson, *Annals*, 153–155.—The reading of A. Roccati, *La littérature historique sous l'Ancien Empire égyptien* (Paris, 1982), 43, "*dnjt*: quarter day" in the entry for year 6 of Weserkaf (Cairo fragment) is baseless, cf. Wilkinson, *Annals*, 219.
[3] For example PT § 657, 716, 794, 1260, 1711, 2056.
[4] Spalinger, *Lists*, 23–24; 28–29; 33.
[5] Spalinger, *Lists*, 101–103.
[6] A. J. Spalinger, *Studies*, VIII, cf. idem, *BSEG* 19 (1995), 40.
[7] For the non-chronological background to the Egyptian lunar days, see Spalinger, "Dating", 383–387.

Beginning of the Lunar Month

Historians presumed that the ancient Egyptian lunar month began on new crescent day down until 1864 when Brugsch suggested that the lunar month started with conjunction. He cited a Ptolemaic text in Karnak: "He (Khonsu, the moon-god) is conceived on *psḏntyw*; he is born on *ꜣbd*; he grows old after *smdt*".[8] Ninety years later Parker paraphrased the text as follows: The moon-god is conceived in the darkness of invisibility on the first day of the lunar month, he is born as the new crescent on the second day, and he wanes after the day of full moon, the 15th day.[9] Parker also cited an earlier, MK text with a similar assertion: "I know, O souls of Hermopolis, what is small on [*ꜣbd*] and what is great on [*smdt*]; it is Thoth." Parker commented: "Thoth is, of course, the moon, small on the day of new crescent and great on the day of full moon".[10]

Brugsch's contemporaries were less enthusiastic than Parker.[11] Only Mahler, and later Sethe, accepted conjunction as the beginning of the lunar month. Subsequently others disagreed, arguing that conjunction is not observable and thus cannot have marked the beginning of the lunar month.[12] Around 1920 Borchardt realized that the Egyptian lunar month must have begun with the first day of invisibility after old (or last) crescent day,[13] i.e. with an observable event.[14] Shortly thereafter Schoch came to the same conclusion independently.[15] Parker argued in detail that the Egyptians reckoned the lunar month from the first calendar day of the moon's invisibility, coinciding with the day of conjunction in ca. 88% of the cases, the day before conjunction in ca. 10.5% and the day after conjunction in ca. 1.5%.[16] Parker based his

[8] H. Brugsch, *Matériaux pour servir à la reconstruction du calendrier des anciens ègyptiens* (Leipzig, 1864), 58–60; Parker, *Calendars*, 9, 12.

[9] Parker, *Calendars*, 9–10.

[10] Cf. also Book of the Dead, title of Spell 135.

[11] Cf. Parker, *Calendars*, 9.

[12] For example, Meyer, *Chronologie*, 49–50; D. R. Fotheringham, *PSBA* 18 (1896), 101; and E. F. Edgerton, *AJSL* 53 (1937), 195.

[13] L. Borchardt, *OLZ* 28 (1925), 620 n. 2; idem, *Mittel*, 19, 30 n. 10.

[14] Actually two events: the first day of invisibility can only be recognized with certainty if the crescent had been observed the day before.

[15] C. Schoch, *Die Neumondfeste* (Berlin-Steglitz, 1928); Reprint: *Astronomische Abhandlungen. Ergänzungshefte zu den Astronomischen Nachrichten* Bd. 8, Nr. 2 (Kiel, 1931), B11–B13; cf. W. Hirschberg, *Zeitschrift für Ethnologie* 66 (1933–34), 245.

[16] Parker, *Calendars*, 9–13.

argument on the ancient texts cited above and on the correspondances of the days of Egyptian terminology for the lunar month with lunar phases.[17] There is more circumstantial evidence. For example, in the Pyramid Texts *psḏntyw* and *ꜣbd* occur together as first and second day of a statue ritual that is also known from the Neferırkareʿ archive.[18] On *psḏntyw* the royal statues were dressed, and they "appeared" on *ꜣbd*. Apparently, the statues' "appearance" equated metaphorically with the appearance of the new crescent on *ꜣbd*. Thus the earliest known instances of *psḏntyw* seem to identify this day as one of invisibility.

It is astronomically possible that a last crescent is visible in southern Egypt on a certain day, but not in northern Egypt.[19] In such a case, the counting of the lunar days would have been out of step for one month. In Egyptian latitudes the new crescent appears in ca. 70% of the cases after a single day of invisibility, in ca. 30% of the cases after invisibility lasting two days.[20] This circumstance could be understood to suggest that the lunar month was reckoned from the second day of invisibility. But, if the second day of invisibility were counted as lunar day 1, how was the first day of invisibility counted? The observers did not, and could not, know beforehand whether the moon would be invisible for one or two days. This would have been clear only on the evening of the day that followed the first calendar day of morning invisibility: if the new crescent was observable, the moon had been invisible for a single day; if the new crescent did not become visible, the moon would be invisible for two days. In other words, the theory that the lunar month could have begun on the 2nd day of inivisibility would mean that for about 36 hours, or 1½ calendar days, neither the observers nor the Egyptians who relied on them (for making offerings on the appropriate lunar days)[21] would have known whether the current calendar day was to be counted as lunar day **31 or **0 or 1 or 2. If this impracticable if not to say nonsensical procedure had

[17] Parker, *Calendars*, 12.
[18] Posener, *Archives* I, 52–57.—For a chronological analysis of these lunar dates see below Chapter III. 8 (end).
[19] For example, the old crescent of December 23 in 1828 BC was visible below Coptos, but not in ME and LE.
[20] Parker, *Calendars*, § 44.
[21] Cf. for example, the lunar days 1, 2, 4, 5, and 6 enumerated by King Ahmose (*Urk.* IV 24.4–7) as appropriate for offerings to the dead.

obtained, then a second day of invisibility that was recorded as apparent "lunar day 1" would be equivalent to a positively incorrect lunar date (see below, Chapter III. 8). Down to the present no discrepancy of this kind has been detected.

Lunar Calendar: 'Civil-based' Lunar Year

Observation of lunar phases, counting of lunar days and lunar-civil double dates do not constitute a lunar year that comprises and counts successively 12 or occasionally 13 lunar months. The existence of an Egyptian lunar year was first suggested by Brugsch;[22] his idea met with disapproval.[23] Borchardt developed Brugsch's ideas, but it was Parker who argued consistently in favor of two lunar calendars, one referring to the heliacal rising of Sirius and one to the first day of the civil calendar. The ruling principle, as formulated by Parker, was that the beginning of the lunar year must not lie before the beginning of the civil year. To conform to this rule, a 13th lunar month had to be intercalated from time to time, usually each third year. This lunar calendar ran parallel to the civil year, and therefore it may be called a civil-based lunar calendar.

For his interpretation Parker relied on the lunar cycle in pCarlsberg 9, which dates from 144 AD or later. The cycle consists of 309 lunar months or 25 civil calendar years. It begins on I Akhet 1 to which it supposedly returns after 25 years.[24] The cycle dates are correct in only 70% of the cases, as Parker was well aware.[25] The cycle comprises nine "great" years of 13 lunar months each and 16 "small" years of 12 months. Nowadays there are doubts whether it reflects a system that was actually used.[26] It is equally doubtful whether the same cycle was

[22] Cf. in detail, Depuydt, *Calendar*, 153–157.

[23] Cf. for example, Ginzel, *Handbuch* I, 168.

[24] W. Barta, *ZÄS* 106 (1979), 1–10, computed a series of 25 year cycles beginning in 2388 BC and ending in 155 AD. Because he misunderstood Parker, Barta used astronomically incorrect first cycle years; for a correction see idem, *GM* 94 (1986), 7–12. Furthermore he did not compute first lunar days, but the respective conjunction days, which renders his cycle tables useless.

[25] Parker, *Calendars*, 25–26.

[26] L. Depuydt, "The Demotic Mathematical Astronomical Papyrus Carlsberg 9 Reinterpreted", *OLA* 85 (1998), 1277–1297.

used for the Macedonian year, which was in effect during in Ptolemaic times alongside the Egyptian calendar.[27]

As proof for the existence of the civil-based lunar calendar Parker cited double dates that not only counted civil and lunar days, but also months differently.[28] The earliest example is the date of an oath taken before the moon god Khonsu on a calendric full moon day in year 12 of Amasis (559 BC).[29] According to Parker, the date is expressed in civil and lunar terms as "regnal year 12 of Amasis, (civil month) II Shemu 13, being the 15th lunar day of (lunar month) I Shemu".[30] This interpretation implies that the months of a lunar year were counted from the first LD 1 after (civil) I Akhet 1.

In 1997 L. Depuydt published a study of the civil-based lunar calendar,[31] "which subsumes and supercedes previous studies".[32] He concluded that "there is no doubt about the existence of the civil-based lunar calendar, first discovered by Brugsch. The proof is of the best kind: astronomical. Civil and lunar double dates are not numerous, but they provide unquestionable evidence for the existence of this calendar".[33] But as early as 1955 Gardiner had challenged Parker's views, rejecting the existence of *any* lunar calendar.[34] In the late 1980s Spalinger began analyzing various aspects of Parker's calendric studies; he concluded that no civil-based lunar calendar existed.[35] And recently, when J. A. Belmonte scrutinized Depuydt's arguments in favor of the civil-based lunar calendar, he also concluded that the data are liable to different interpretation.[36] Thus there is no consensus among the specialists.

As Spalinger has pointed out, it is possible to analyse presumed civil-lunar double dates without considering the validity of the civil-based lunar year itself:[37] ". . . chronographers do not need it, . . . Parker and

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[27] A. Jones, "On the Reconstructed Macedonian and Egyptian Lunar Calendars", *ZPE* 119 (1997), 157–166.

[28] Parker, *Calendars*, 26.

[29] R. A. Parker, *MDAIK* 15 (1957), 208–212.

[30] Depuydt, *Calendar*,

[31] Depuydt, Calendar.

[32] J. P. Allen, *The Heqanakht Papyri* (New York: PMMAEE 27, 2002), 135 n. 42.

[33] Depuydt, *Calendar*, 217.

[34] A. H. Gardiner, "The Problem of the Month-names", *RdE* 10 (1955), 9–31.

[35] Cf. for example, A. J. Spalinger, in: *Hommages à J. Leclant* (BdE 106/4, 1994), 364 n. 4.

[36] Belmonte, "Questions", 14–15.

[37] A. J. Spalinger, "Ancient Egyptian Calendars: How many were there?", review article of Depuydt, *Calendars, JARCE* 39 (2002), 241–250, at 250.

later Egyptologists have never used it . . ." The assertion is correct, in general, but the Heqanakht papyri may represent an exception. In his letters Hekanakht refers to the months *šf-bdt, rkḥ-ʿ3*, and *ḫnt-ẖty-prtj*. The internal chronology of the letters depends on whether these months are civil or lunar. For example, Spalinger sees "no indications of a lunar calendar operating in this correspondance";[38] Belmonte likewise asserts that the months are not lunar, but "are clearly mentioned in a civil calendar context".[39] By contrast, the very use of these month names in the Heqanakht papyri suggests to Allen "that farmers also followed the lunar calendar—understandably so, since the phases of the moon were much easier for them to keep track of than the artificial sequence of numbered days in the civil calendar."[40] Allen identifies this presumed lunar calendar as the civil-based lunar calendar, without discussing the possibility that it might be the Sothis-based lunar calendar.[41] Hekanakht would have meant September/October (Greg.) when he referred to the month *ḫnt-ẖty-prtj* as the 10th month of the civil calendar or the civil-based lunar calendar; or March/April (Greg.) if *ḫnt-ẖty-prtj* was the 10th month of the Sothis-based lunar calendar.[42] In the former case Hekanakht "postponed the beginning of the household's new salary schedule to late September", although it would have been possible to start "two or even three lunar months earlier".[43] Perhaps this and other difficulties could be resolved by assuming that Hekanakht meant months of the Sothis-based lunar calendar, rather than the civil-based lunar calendar. This discussion illustrates how the vagueness of the ancient sources, as exemplified in the calendric material contained in the Hekanakht papyri, are capable of very different interpretations, depending on the bias of the scholar.

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[38] A. Spalinger, "Calendrical Evidence and Hekanakhte", *ZÄS* 123 (1996), 85–96; esp. 89.
[39] Belmonte, "Questions", 21.
[40] Allen (n. 32), 135–136.
[41] W. Barta, *ZÄS* 110 (1983), 19.
[42] Based on Allen's assignment of year 8 in the papyri to Senwosret I.
[43] Allen (n. 32), 137 n. 47.

III. 7 LONG-TERM VARIATION IN THE MOTIONS OF THE EARTH AND THE MOON

Kurt Locher

Of the three sidereally defined periods—the year, the lunar month, and the day—, the year is the most stable in terms of modern methods of time-keeping such as atomic time based on molecular or electron-tilting oscillations. Its slight long-term variation is irrelevant for Egyptian chronology, because the artificial 365.0-day civil year, which was kept through all epochs, would always yield an unambiguous number of days elapsed between any two historical dates of relative chronology.

This is far from true for the lunar month and the day: The number of days elapsed between any pair of the same moon phases many centuries apart is affected by two long-term variations. The slowing of the earth's rotation over time must be studied with the greatest possible care, both empirically, using historical astronomical data gathered from non-Egyptian records, and theoretically, by calculating its physical cause (the amount of kinetic energy released from rotational momentum and transformed into heat by tidal friction). Thanks to Stephenson's recent extensive work[1] we now know that the actual number of days elapsed from any OK date until today differs by just under one day from what it would have been if the velocity of the earth's rotation remained constant.[2]

Long-term variation in the orbiting period of the moon has essentially the same physical cause: the slowing of the earth's rotation means a decrease in angular momentum, which the motion of the body exerting the causing force, i.e. the moon, must compensate by acceleration. The total number of lunar months elapsed between any OK date and today differs from the number they would have amounted to without such an acceleration by roughly one hundredth of a month.[3]

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[1] Stephenson, *Eclipses*.
[2] Ibidem, Figs. 1.6, 2.1, 14.1, 14.2.
[3] Ibidem, § 2.6.2.

Since both differences result from an integration over time of a linear effect, each increases quadratically with respect to the time elapsed. Moving back in time from today towards the OK, the result reduces, e.g., to one fourth if we move back halfway.

Relevant Peculiarities of the Motion of the Moon

There are also periodic short-term variations in lunar motion. One of them arises from the elliptic shape of its orbit and the dynamical consequences implied which results in variations in speed.

Since the sun appears, simply spoken in the ancient way, to move through exactly 12 zodiacal signs in the course of a year, and since there are 12 (exceptionally 13) new moons within this same period, the sign in which a new moon is seen from earth is the one adjacent (to the *left* as seen from northern latitudes) to the sign where the preceding new moon was seen.

Thus every month the breadth of roughly one sign is covered twice by the moon moving through the zodiac; if the moon happens to be in that part of its orbit where its speed is smallest (both absolute and apparent-angular), the month will be considerably longer than average. Such minimum speed occurs near apogee (απο γην, "away from the earth"), the point on the elliptic orbit most distant from the earth. Since Ptolemy noted the effect of this variable velocity on the position of the moon (or a planet), the phenomenon has been called "the anomaly" (αν-ομαλος, "uneven").[4] Calculating the anomaly in the case of the moon's orbit is a complex procedure, because it is considerably perturbed dynamically by the gravity of a third body (the sun); however, this perturbation is negligible in the case of a planetary orbital ellipse. The perturbation in the moon's case is the reason why the apogee is *spatially* (more exactly: *sidereally*) not always on the same side of the earth, but moves slowly around it, completing a full cycle in roughly 9 years, a fact which has been termed apsidal motion (αψις, "apse" (of the ellipse) since Hipparchus.

The fact that the beginning of an Egyptian lunar month depended on the observation of last visibility of the waning moon at dawn must also be taken into account. Unlike all other effects considered above,

[4] Ptolemy, *Almagest*, § IV 2, Edition Heiberg (Leipzig, 1898), 269.

the success of such an observation depended not only on the lunar coordinate measured *along* the ecliptic, but also *at right angles* to it, i.e. on the ecliptical latitude. Egypt's geographic position, which is to the *north* of the equator, favours observation of the moon if it is situated *north* of the ecliptic, by contrast to a symmetrical position south of it, especially for marginal situations which always occur near the horizon.[5]

The orbit of the moon is inclined against the ecliptic by roughly 5°, so that the moon crosses it twice every month at points called the nodes. Like the apogee, these nodes are not fixed, but they revolve around the earth in a cycle of roughly 18 years.

The position of the moon near a node is crucial for the occurrence of an eclipse; both solar and lunar eclipses are relevant for the chronology of most ancient civilizations, but, exceptionally, not for Egypt. Oddly enough, there are very few, if indeed any reports of eclipses from Egypt. For that reason, eclipse theory need not be included here.

[5] Ibidem, Heiberg, 270.

III. 8 LUNAR DATES

Rolf Krauss

Computation of Old and New Crescent

An initial attempt to compute old and new crescent was made by the astronomer K. C. Bruhns around 1880.[1] He based his calculations, which were unsuccessful, on observations recorded at Athens by the astronomer J. Schmidt. 15 years later F. Wislicenus also admitted defeat, asserting: "if the sky is clear, but under otherwise differing astronomical conditions, the first appearance of the crescent can occur 1 to 3 days after conjunction".[2] It was K. Fotheringham who first succesfully calculated old and new crescent, utilizing Schmidt's observations, in addition to others.[3] The basic parameters of Fotheringham's calculation are lunar altitude and lunar and solar azimuth.[4] For the old or new crescent to be considered visible, it must have a minimal altitude *h* which is dependent on the distance Δ in azimuth of the sun and moon at the moment when the centre of the sun is in the mathematical horizon; the position of the crescent is computed geocentrically, i.e. without parallax.[5] M. Maunder,[6] P. V. Neugebauer and C. Schoch[7] improved upon the minimal altitudes *h* of Fotheringham. In an earlier version of his astronomical tables P. V. Neugebauer incorporated crescent visibility criteria of Fotheringham and Maunder;[8] in his later *Astronomische Chronologie*,

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[1] A. Mommsen, *Chronologie: Untersuchungen über das Kalenderwesen der Griechen insonderheit der Athener* (Leipzig, 1883), 69–80.

[2] W. F. Wislicenus, *Astronomische Chronologie: ein Hülfsbuch für Historiker, Archäologen und Astronomen* (Leipzig, 1895), 29.

[3] Mommsen (n. 1), 69–73.

[4] K. Fotheringham, "On the Smallest Visible Phase of the Moon", *Monthly Notices of the Royal Astronomical Society* 70 (1910), 527–531.

[5] Contemporary astronomers somtimes overlook the fact that Fotheringham's model is geocentric, cf. R. Krauss, DE 57 (2003), 53–54.—For a topocentric model see J. A. R. Caldwell & C. D. Laney: <http://www.saao.ac.za/~wgssa/as5/caldwell.html>.

[6] M. Maunder, *Journal of the British Astronomical Association* 21 (1911), 355–362.

[7] C. Schoch, *Planetentafeln für Jedermann* (Berlin-Pankow, 1927); idem, in: Neugebauer (n. 9), I 79, Tafel E 21.—Use of Schoch's data is now known as "Indian method" following adoption by the Indian Astronomical Ephemeris in 1966.

[8] P. V. Neugebauer, *Hilfstafeln zur Berechnung von Himmelserscheinungen. Tafeln zur astronomischen Chronologie* III (Leipzig, 1925), VII, Tafel 14.

devised for the use of historians and astronomers, he used Schoch's criteria.[9] Between the publication of Neugebauer's Tables in 1929 and ca. 1990 Egyptologists used them for astronomical computations involving solar, lunar, planetary, and stellar data. Neugebauer anticipated that his Tables would become obsolete after half of a century.[10] And indeed the situation changed in the 1980's when astronomical software to be used with computers became available. (All astronomical calculations for Chapters III. 8 and 10 were made with the program *UraniaStar Release 1.1* [M. Pietschnig & W. Vollman, Vienna, 1995]. The program was developed under the supervision of the astronomer Hermann Mucke. For the program's reliability, see M. G. Firneis & M. Rode-Paunzen, "Progress-Report on Egyptian Astrochronology", in: Bietak, ed., *SCIEM Haindorf* 2001, 48).

Especially for lunar positions, modern astronomical computation yields results different from Neugebauer's Tables. One reason is that research has significantly changed the values for Δt (delta t), the difference between Universal Time and Terrestrial Time that results from the slowing of the earth's rotation.[11] Regardless, in many cases the ancient date of observability of old or new crescent remains the same, whether calculated with the outdated parameters of Neugebauer or according to the most recent ones.[12]

In the late 1980's B. Schaefer, following an earlier attempt by F. Bruin,[13] developed a model for reckoning old and new lunar crescents taking into consideration: (1) the physiology of the human eye, (2) the brightness of the twilight sky, (3) the surface brightness of the moon, (4) the extinction in the atmosphere, and (5) the local conditions. According to Schaefer, there is a general shift from clear skies in winter to hazy skies in summer, and thus in the northern hemisphere the minimal altitude is lower in winter and higher in summer. This rule does not seem to apply to all regions, but it is valid for Egypt.[14] Thus Schaefer's model represents an improvement over the visibility

[9] P. V. Neugebauer, *Astronomische Chronologie* I, II (Leipzig & Berlin, 1929).
[10] Neugebauer (n. 9, I), V.
[11] See above Locher, Chapter III. 7.
[12] Krauss (n. 5), 52–53.
[13] F. Bruin, *Vistas in Astronomy* 21 (1977), 331–358.
[14] M. Shaltout, "Study of the Solar Radiation over Menia", *Renewable Energy* 23 (2201), 621–639, at 631–634; and personal communication, January 17, 2004.

criteria of Schoch and others, as far as they do not take into account the seasonal variation of extinction and its daily random variability. Table III. 8.1 lists a selection of Schoch's and Schaefer's minimal crescent altitudes *h*, relating to Δ. In the Table months apply only to Schaefer's figures;[15] Schoch's do not change during the year.

For example, if the distance Δ in azimuth is 0°, then according to Schoch the crescent ought to be visible throughout the year if $h \geq 10.4°$. By contrast, Schaefer defines the minimal altitude as a mean value *h* together with its mean square root error σ. If Δ = 0°, then for example, in December $h = 10.2° \pm 0.6°$, i.e. for ca. 68% of crescents $h = 10.2°$ is the minimal altitude; for 16% it would be 10.2° to 10.8°, and for the remaining 16% it would be 10.2° to 9.6°. If the crescent is within $h \pm \sigma$, then visibility or invisibility of the crescent depends on extinction at the time of observation. Thus $h \pm \sigma$ is a zone of uncertainty, because extinction cannot be predicted exactly. If the crescent is above $h \pm \sigma$, then visibility is to be expected; if the crescent is below $h \pm \sigma$, it ought to be invisible, although an outlier is a rare possibility.

Table III. 8.1

	Schaefer h (Δ = 0°)	Schoch h (Δ = 0°)	Schaefer h (Δ = 10°)	Schoch h (Δ = 10°)
December	10.2° ± 0.6°		8.8° ± 0.8°	
March/Sept	11.0° ± 0.8°	10.4°	9.5° ± 0.9°	9.3°
June	11.6° ± 0.7°		10.1° ± 1.1°	
	h (Δ = 15°)	h (Δ = 15°)	h (Δ = 20°)	h (Δ = 20°)
December	7.5° ± 0.7°		6.6° ± 0.7°	
March/Sept	8.5° ± 1.2°	8.0°	7.6° ± 0.9°	6.2°
June	9.0° ± 0.8°		7.9° ± 0.8°	

[15] I owe specific numerical values for h ± σ and the permission to use them in publications to a generous personal communication from Schaefer in November 1999; see also R. Krauss, "An Egyptian Chronology from Dynasties XIII to XXV", in: Bietak, *SCIEM Vienna 2003*, n. 25; in press.

Negative and Positive Errors in Lunar Observation

Provided the weather was fine, old crescent ought to have been always visible at dawn of a LD 29. The critical day was LD 30. If the crescent was still visible at dawn of a LD 30, then the current lunar month had 30 days and the following lunar month began on the next calendar day. If the crescent was not visible at dawn of LD 30, then a new lunar month had begun and the expired lunar month had 29 days. The new crescent appears on the second or third calendar day after morning invisibility; an observer could determine the first day of invisibility with certainty only when he had been able to see the crescent on the previous morning. According to Parker, mistakes could occur on either day: "An Egyptian lunar date as given in the civil calendar and as calculated by modern tables may lack agreement by a day . . . due to faulty observation or any other reason".[16] Parker left open whether there is a 50% chance that a lunar date is correct, or whether it is more probable that a lunar date is correct than wrong. Nevertheless, it is clear that Egyptian lunar dates exhibit random qualities, and therefore analysis of them mandates taking into consideration the mathematical probability of correct and mistaken lunar dates.

By definition, an ancient lunar date is "correct" if it is confirmed by modern astronomical computation. A Egyptian lunar date is negatively (or positively) incorrect if the respective lunar phase is one day too early (or too late). A negative error results when the observer does not see an old crescent that is visible under favorable meteorological conditions somewhere else. A negatively incorrect lunar date implies the beginning of an Egyptian lunar month one day too early. A positive error implies a delay of the beginning of an Egyptian lunar month by one day, i.e. the month would begin one day too late. A positive error should not result from direct observation, because a crescent which is not present cannot be seen. A positive error may occur on a cloudy day when the observer guesses that the crescent is present above the clouds. Late or early lunar dates are evidently not symmetrical errors; therefore the likelyhood of each occurring should not be the same.

[16] Parker, *Calendars*, 211; idem, *JNES* 16 (1957), 39–40.

Error Quotas in Lunar Dates

The three possible sources of error in Egyptian old crescent observation are: a) the observer himself, who might falsify data; b) observational difficulties when the crescent is in the zone of uncertainty; c) observational difficulties resulting from unfavourable weather conditions, i.e. haziness or overcast skies due to clouds or a sandstorm. Presumably the accuracy of Egyptian old crescent observation was the same as Babylonian new crescent observation. In both cultures observations were made under similar meteorological conditions by experienced observers.[17] C. Schoch[18] and P. H. Huber[19] investigated the accuracy of Babylonian lunar observation. They concluded that at least 85% of the recorded lunar dates were correct new crescent observations. Recent analysis suggests that Schoch used not only observed crescents, but predicted ones as well, whereas Huber's data consist of observed crescents only.[20]

F. R. Stephenson's team analysed the circumstances of visibility for 209 observed Babylonian new crescents[21] published by Hunger.[22] When topocentric lunar positions were plotted against different versions of the geocentric visibility lines of Schoch, 8 of 209 crescents were below the visibility line. If geocentric lunar positions are plotted, only 2 crescents are to be found just below Schaefer's visibility line, which if slightly adjusted, includes them also.

According to Schaefer's criteria, ca. 10% of the 209 new crescents were sighted one day too late, presumably because of high extinction or some other reason. Thus the relative frequency of negative errors in these 209 Babylonian crescent observations is ca. 10%. The 95% confidence interval for the true probability of negative errors in a sample of 209 new crescents is 6% to 14%. Correspondingly it can be expected that 86% to 94% of Egyptian old crescent observations were correct, the quota of negative errors stemming from extinction being 6% to 14%.

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[17] For the *imy-wnwt*, the astronomer of Egypt, see J.-L. Fissolo, *Égypte, Afrique et Orient* 21 (2001), 15–20.

[18] C. Schoch, in: S. Langdon & J. K. Fotheringham, eds., *The Venus-Tablets of Ammizaduga* (Oxford, 1928), 96–97.

[19] P. Huber, *Astronomical Dating of Babylon I and Ur III* (Malibu: MJNE. Occasional Papers 1/4, 1982), 25ff.

[20] L. Fatoohi, F. R. Stephenson & S. Al-Dargazelli, "The Babylonian First Visibility of the Lunar Crescent: Data and Criterion", *JHA* 30 (1999), 51–72 at 64.

[21] Cf. n. 20.

[22] Sachs & Hunger, *Diaries*.

This result is supported by a computation (sic) of about 150 old crescents for the years between 2001 and 2013 AD at the latitude of Illahun, yielding about 84% crescents (95% confidence interval: 78% to 90%) that should (have) be(en) visible without difficulty; about 16% of the crescents (95% confidence intervall: 10% to 22%) would (have) be(en) situated within the zone of uncertainty.[23] Presuming that high and low extinction are equally possible, it is to be expected that in 84% + 8% = 92% of the cases (95% confidence intervall: 89% to 94%) the sightings would (have) be(en) correct, and in 8% (95% confidence intervall: 5% to 11%) negatively incorrect. Thus it may be expected that under favourable weather conditions Babylonian and Egyptian crescent observations yielded ca. 90% correct lunar dates and ca. 10% negatively incorrect ones.

In the 1990's Doggett and Schaefer organised "moon watches" to establish the Lunar Date Line for specific months. Their evidence for negative mistakes is indirect:[24] "Of 520 negative reports, 5 were made by observers who missed an easy sighting on the following night. We suspect the rate of negative errors is greater (and probably much greater) than 1%". The evidence for positive mistakes is direct: "Of the 20 observers in the northeast [of North America where the moon should not have become visible], 3 reported sighting the Moon. In all three cases, the reported time of sighting, orientation of the horns, and direction of the Moon were grossly in error. The large errors in reported details confirm that these three observations were positive errors. From our small sample [from Moonwatch 5], the positive error rate is 15%". But, the three reports might just as well be spurious; in fact, no modern series of observations provides a reliable basis for extrapolating the quality of professional ancient Egyptian (and Babylonian) old (and new) crescent observations.

[23] Krauss (n. 15).

[24] L. Doggett & B. Schaefer, "Lunar Crescent Visibility", *Icarus* 107 (1994), 388–403, esp. 402; see also B. Schaefer, "Lunar Crescent Visibility", *Quarterly Journal of the Royal Astronomical Society* 37 (1996), 759–768, at 760.

[25] *Climates of Africa*, J. F. Griffiths, ed., (Amsterdam: *World Survey of Climatology* 10, 1972), 84–85, 126–128.

Mistakenly Conjectured Lunar Dates

If the sky is overcast, visibility or invisibility of the moon has to be conjectured. There are statistics available for the average monthly cloudiness at Egyptian sites.[25] The mean cloudiness decreases between the Delta and UE.[26] Presuming the climate in Egypt has not changed since the end of the OK,[27] modern regional conditions are applicable to the MK. Around Illahun the yearly mean cloudiness amounts to 20%, i.e. during the year the probability that clouds obscure old crescent amounts to p = 0.2, complemented by the probability of q = 0.8 that old crescent is visible. Under these circumstances it is to expected that over the years, at most ca. 20% of the old crescents went unobserved.[28]

The proportion between lunar months of 29 and 30 days is 47:53; the total of 20% old crescents on overcast days divide into 9.4% old crescents on a LD 29 and 10.6% on a LD 30. On a overcast LD 29, the assumption that the crescent is present is correct, the opposite supposition negatively incorrect. Thus 4.7% of all lunar dates are correct and 4.7% negatively incorrect. If it is a LD 30 and the sky is overcast, then the assumption concerning the presence of the crescent is (a) correct, and the opposite assumption (b) negatively incorrect. If it is not a LD 30 but rather a LD 1 of the next lunar month, then the assumption that the crescent is present is (c) positively incorrect and the opposite assumption (d) correct. These possibilities result in 5.3% correct and 2.65% negatively or positively incorrect lunar dates each. Thus the 20% conjectured lunar dates divide into 10% correct dates, 7.35% negatively incorrect and 2.65% positively incorrect dates. Altogether (20% conjectured and 80% observed crescents) there are 82% correct dates, 15.35% negatively, and 2.65% positively incorrect dates. The percentages of correct and incorrect observations following from 20% at Illahun and 12.5% conjectures at Luxor are expressed in Table III. 8.2 as rounded decimal values.

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[26] For example the mean yearly cloudiness in Cairo amounts to 2 octas or 25%, in Luxor to 1 octa or 12.5%, (cf. n. 25).

[27] Cf. K. W. Butzer, "Klima", *LÄ* III, 456.

[28] The result was obtained by first computing the probabilities that during 62 lunar months or ca. 5 years in exactly 0, 1, 2, 3 . . . 62 instances old crescent was hidden by clouds. According to standard procedure it follows that the crescent was hidden in *at most* 12 to 14 of altogether 62 instances, corresponding to a mean of ca. 20%.

Table III. 8.2

Conjectures	Correct	Negatively Incorrect	Positively Incorrect
20%	0.82	0.153	0.026
12.5%	0.85	0.134	0.016

Figs. III. 8.1–3 (below) present the observability of the Illahun lunar dates in simplified schemes, according to three different absolute dates proposed for year of 1 Amenemhet III. The lunar positions are plotted against the visibility line of Schaefer. To avoid a three-dimensional representation only one visibility line is used and each crescent is plotted against it, as if it were its own visibility line. Different values for Δt are considered,[29] resulting in different positions of one and the same crescent; the positions are represented as a single line corresponding to a difference in Δt of roughly ± 1 h.

Fig. III. 8.1 represents the positions of the old crescents when the Illahun lunar dates (ILD) are computed as if 1 Amenemhet III = 1844/43 BC. Fifteen of 21 crescents would have been observable above the visibility line. There would have been one negatively incorrect observation, since crescent ILD 10 should have been visible in position 10*. The crescents ILD 6 and 12 would have been just below the visibility line, whereas ILD 13, 14 and 15 would have been far below, altogether corresponding to five positively incorrect observations.

Fig. III. 8.2 shows that for 1 Amenemhet III = 1819/18 BC, the two crescents ILD 2 and 16 would have been negatively incorrect observations. 19 of 21 ILD would have been observable above the visibility line and none below.

Fig. III. 8.3 demonstrates that for 1 Amenemhet III = 1794/93 BC sixteen crescents would have been visible, two would have been unobservable as positively incorrect and three would have been missed as negatively incorrect.

The situation changes if P. J. Huber is followed with Δt computed according to a formula of Morrison and Stephenson.[30] Then Δt is 12.6 h,

[29] The lunar positions in Figs. III. 8.1–3 are computed using Spencer Jones's formula for Δt, based on an uncertainty of ± 1 h.—Cf. H. Spencer Jones, "The Rotation of the Earth, and the Secular Accelerations of the Sun, Moon and Planets", *Monthly Notices of the Royal Astronomical Society* 99, (1939), 541–558.

[30] P. J. Huber, *Akkadica* 119–120 (2000), 173–176; with reference to L. V. Morrison & R. L. Stephenson, in: W. Fricke & G. Teleki, *Sun and Planetary System* (Dordrecht, 1982), 173–178.

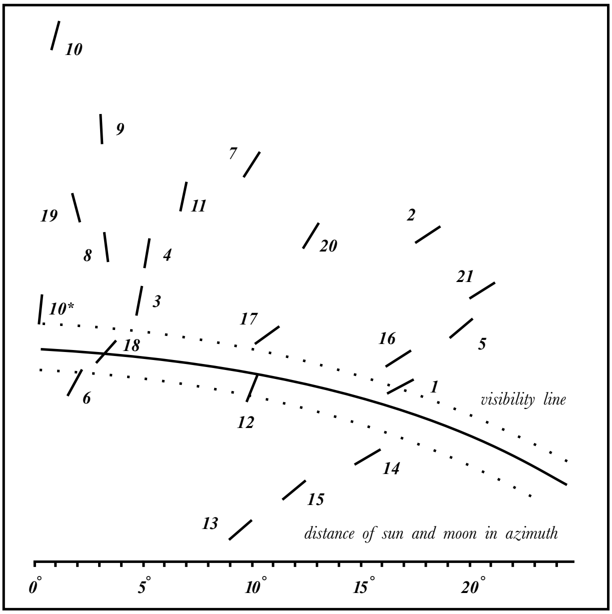


Fig. III. 8.1

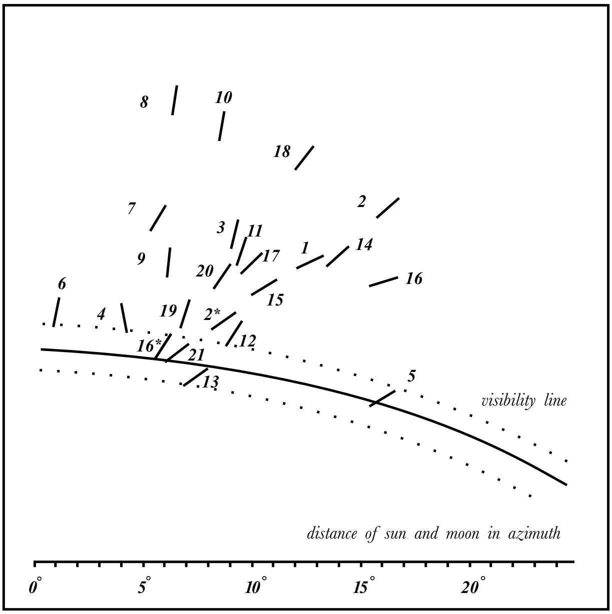


Fig. III. 8.2

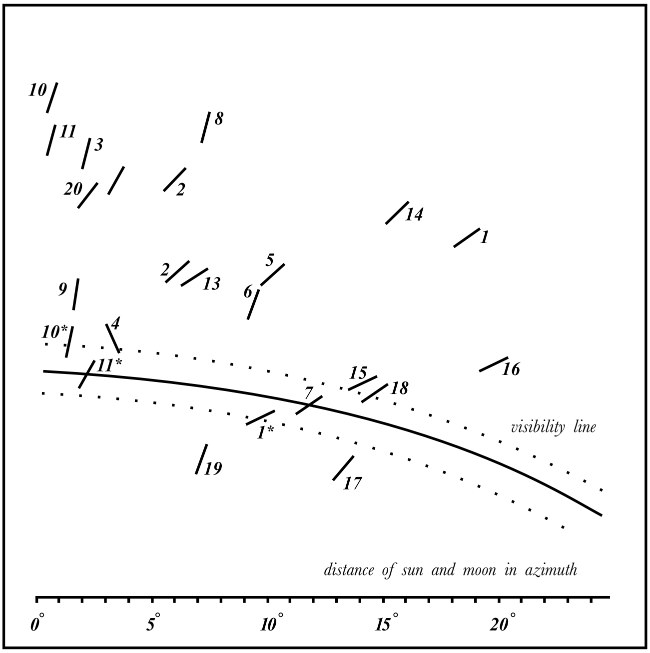


Fig. III. 8.3

instead of Spencer Jones's 10.56 h for ca. 1800 BC. The increased value for Δt results in a decrease of lunar altitude at the moment when the centre of the sun is in the horizon. In other words, if the larger Δt is presumed, those crescents in Figs. III. 8.1–3 that are just below the visibility line were definitely below it. Of interest is ILD 13 in Fig. III. 8.2, because it is close to the lower limit of visibility. This crescent would have tended to be visible if Δt ≤ 12.6 h, invisible if Δt > 12.6 h.

Partial Repetition of Lunar Dates after 25 Egyptian Years

The lunar positions represented in Figs. III. 8.1–3 are 25 Egyptian years apart; contrary to expectation the positions differ markedly with respect to the visibility line. Egyptologists generally assume that lunar dates repeat after 25 Egyptian years,[31] because 25 Egyptian years

[31] E.g., K. A. Kitchen, "The Chronology of Ancient Egypt", *World Archaeology* 23 (1991), 201–208, at 204: "these moon-risings occur in the ancient calendar every twenty-five years."

correspond to 309 mean (synodic) lunar months of 29.53059 days each, the difference being only about an hour:[32]

> 25 Egyptian years = 25 × 365 days = 9125 days = 309 mean synodic months = 309 × 29.53059 days = 9125 days minus 1 hour and 7 minutes[33]

Actually an observer counts either 29 or 30 full days in a lunar month and arrives at the length of the mean synodic month by calculation based on the observation of a great number of lunar months of either 29 or 30 days.

A lunar date repeats on the same calendar day, if 9125 days comprise 309 lunar months of which 164 are lunar months of 30 days and 145 are lunar months of 29 days: (164 × 30 days) + (145 × 29 days) = 4920 days + 4205 days = 9125 days. Because the movement of the moon is irregular, there can be 165 lunar months of 30 days and 144 lunar months of 29 days in a series of 309 lunar months. If so, a lunar date does not repeat on the same calendar day after 25 years = 9125 days, but rather after 9126 days.[34] Or if there are 163 lunar months of 30 days and 146 lunar months of 29 days in a series of 309 lunar months, then a lunar date does not repeat after 25 years on the same calendar day, but rather after 9124 days.

Apparently the irregularity results because the mean synodic movement (a) comprises (b) the anomalistic and (c) draconitic movement of the moon, which do not share a common period of 9125 days = 25 Egyptian years. The mean anomalistic velocity is not the same after 25 years, whereas the mean draconitic movement results in a different latitude of the moon.

9125 days = (a) 309 × 29.53059 d + 0.04 d =
(b) 331 × 27.55455 d + 4.44 d =
(c) 335 × 27.21222 d + 8.91 d

On average only about 70% of the dates in a set repeat on the same day after a single 25 year shift.[35] For multiples of 25 years, percentages

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[32] So for example, Beckerath, *Chronologie*, 48–49.

[33] Within the siderial and synodic months the moon travels at a mean velocity of 13.176° per day. Within 25 Egyptian years = 24.982 siderial years, the sun travels in the mean 24 × 360° + 353.683°, whereas the moon travels 333 × 360° + 354.272°. In 25 Egyptian years the positions of sun and moon have decreased by about 6.317° and 5.728° respectively, whereas their original distance has decreased only by about 0.52°, i.e. the distance that the moon travels in an hour.

[34] For a specific example see Krauss, in: Bietak, *SCIEM Haindorf 2001*, 190–192.

[35] Krauss, *Sothis*, 27; similarly Parker, *Calendars*, 25–26.

of correct repetitions decrease. Shifts of 2 × 25 and 3 × 25 years yield exactly repeated dates in only 50% of the cases.[36] Under these premises a large set of Egyptian lunar dates tends to have one solution with a maximum of correct dates whereas shifts of ± 25 years have less correct dates. This is exemplified by 37 alternative solutions for the Illahun lunar dates between 2286 and 1387 BC. The calculations use 37 alternatives for 1 Amenemhet III, each separated by 25 years from the next.

As Fig. III. 8.4 shows, the alternatives differ in the percentages of correct and incorrect dates, both negative and positive. There is one

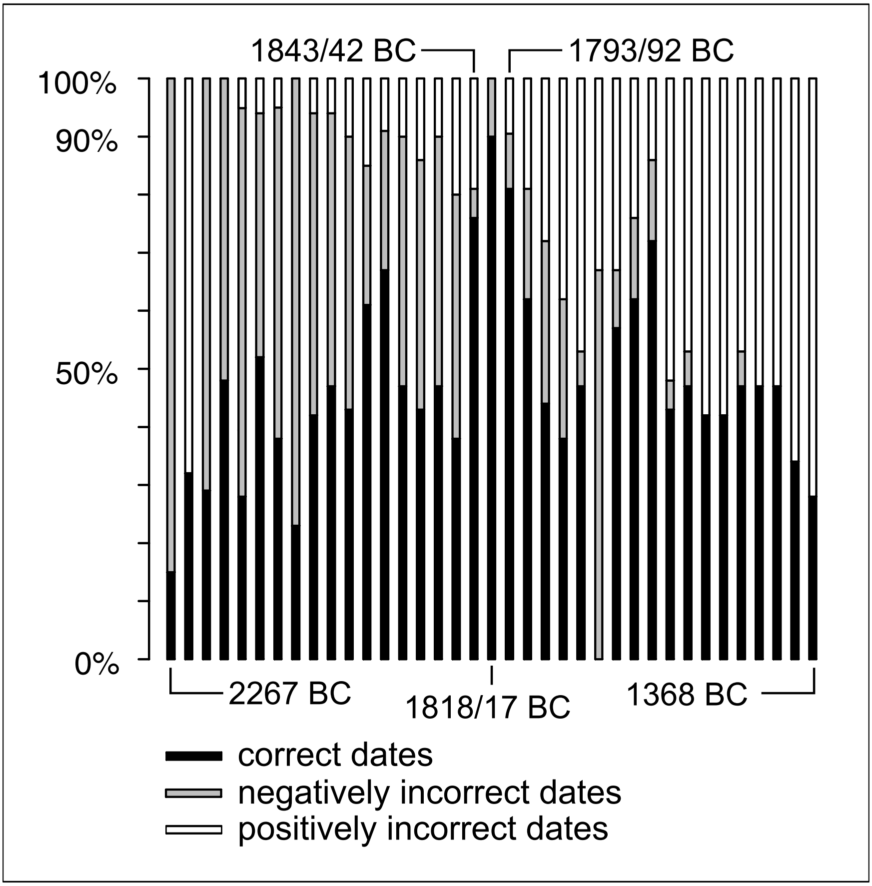


Fig. III. 8.4

[36] Krauss, *Sothis*, 27.

set with ca. 90% correct dates (1 Amenemhet III = 1819/18 BC), whereas the remaining 10% are negatively incorrect. There are seven sets with 60% to 80% correct dates and varying percentages of negatively and positively incorrect dates. The other sets display small percentages of correct dates, whereas their percentages of negatively or positively incorrect dates are high. The trend is clearly to more negatively incorrect dates for shifts backwards and to positively incorrect dates for shifts forwards. An increase in the number of correct lunar dates after multiples of 150 Egyptian years is to be noted. This results from the fact that the synodic, anomalistic, and draconitic months have an approximate common period of 150 Egyptian years. Nevertheless, instead of yielding a series of various solutions, which are all astronomically equally possible, there is practically only one astronomically workable solution for the Illahun lunar dates.

The different astronomical possibilities can be evaluated by computing the respective probabilities. The appropriate tool to deal with lunar dates and their three properties is the trinomial formula for probability P:

$$P = \frac{n!}{x! \times y! \times z!} \times p_1^x \times p_2^y \times p_3^z$$

n = x + y + z; x = correct lunar dates; y = negatively incorrect lunar dates; z = positively incorrect lunar dates; p_1, p_2, and p_3 are the probabilities of x, y and z (see Table III. 8.2). Table III. 8.3 contains the respective probabilities if the ILD are computed for different first years of 1 Amenemhet III, including Luft's suggestion that this might be 1855/54 BC.[37] As Table III. 8.3 implies, only 1 Amenemhet III = 1819 BC ± 25 years is by any means probable (cf. also Figs. III. 8.1–3).

Table III. 8.3

1 Amenemhet III	correct	neg. incorrect	pos. incorrect	probability
1869/68 BC	8	9	4	6.2×10^{-7}
1855/54 (Luft)	6	0	15	2.7×10^{-20}
1844/43	16	1	4	0.00032
1819/18	19	2	0	0.114
1794/93	17	2	2	0.020
1769/68	3	4	4	0.00027

[37] Luft, Fixierung, 228; cf. below Krauss, Chapter III. 10.

Recorded Lunar Dates from Dyn. 5 to Dyn. 22.

Dates of a Lunar Feast (Tepi Shemu) in the Bubastide Period[38]

The reign of Psammetichus I began in February 664 BC and the reign of Taharqa, 26 years earlier, in 690 BC. According to the Tang-i Var inscription, Shebitku ruled from at least 707/706 BC. The highest attested date for Shabaka is year 15. Thus 1 Shabaka corresponds to 722/721 BC at the latest. It is possible, but not assured that Shabaka defeated Bocchoris in the former's year 2;[39] thus 6 Bocchoris might be 723/722 BC = 2 Shabaka or slightly earlier.

The Bocchoris-Apis was the successor of the Apis that died in 37 Shoshenq V. According to data concerning the three Apis bulls buried between 28 Shoshenq III and 37 Shoshenq V, and presuming that Pami's reign ended in a year 7, 95 years elapsed between 1 Shoshenq III and 37 Shoshenq V (inclusive). If the Bocchoris-Apis was born very soon after the death of its predecessor and had a life span of 26 years at most (the maximum life span attested),[40] the upper limit for 1 Shoshenq III is 723/722 BC + 26 + 95 = 844/843 BC. This limit would need to be adjusted upwards, if Shebitku's reign began before 707/706 BC and/or Shabaka occupied the throne longer than 15 years.

When reckoning the lower limit, it must be borne in mind that Shepsesreʿ Tefnakhte may or may not have ruled in Memphis as predecessor of Bocchoris for at least 7 full years. Tefnakhte's initial takeover of Memphis occurred at the earliest in the course of 38 Shoshenq V. In his 20th (?) year Piye drove an apparently non-royal Tefnakhte out of Memphis; subsequently the kings Shepsesreʿ Tefnakhte and Bocchoris may have ruled for at least 12 full years (7+5) or more before the death of the Bocchoris-Apis. Then, the lower limit for 1 Shoshenq III would be ca. 722 BC + 12 + 2 (?) + 95 = 831 BC or 722 BC + 5 + 2 (?) + 95 = 824 BC, if Shepsesreʿ Tefnakhte did not rule as king in Memphis.

Aston concluded that the rival kings Takelot II and Petubaste I ruled Thebes when Shoshenq III reigned in LE. The synchronism 5 Petubaste

[38] For the TIP cf. above Jansen-Winkeln, Chapter II. 9, and Zibelius-Chen, Chapter II. 12.

[39] Krauss (n. 15).

[40] J. Vercoutter, "The Napatan Kings and Apis Worship", *Kush* 8 (1960), 62–76 at 64; idem, *MDAIK* 16 (1958), 339–342.

I = 12 [Shoshenq III] is attested while [4 Takelot II = 1 Shoshenq III] or [5 Takelot II = 1 Shoshenq III] is deducible.[41] If 1 Shoshenq III lies between 844 and 824 BC, then 1 Petubaste I falls in 837 to 817 BC and 1 Takelot II in 848 to 827 BC. The lunar dates of the *Tepi Shemu* feast provide a means for determining exact dates.[42] The feast is documented at Karnak from the NK to the Saite Period;[43] according to *MHC* 1451ff., it began on LD 1 and lasted till LD 5. Parker computed the latest known example which is dated to 14 Psammetichus I.[44] Vernus and Krauss followed Parker to interprete Bubastide examples of the *Tepi Shemu* feast as lunar dates.[45] According to Vernus and Kruchten, the inductions of priests took place during the *Tepi Shemu* feast.[46] Bubastide examples of the **Tepi Shemu* feast and/or of inductions are:[47]

*(A) 11 Takelot II: I Shemu 11	(B) 7 Petubaste I: I Shemu [1]
(C) 8 Petubaste I: I Shemu 19	*(D) 39 Shoshenq III: I Shemu 26

The figures in Table III. 8.4 assume that 11 Takelot II fell between 838 and 817 BC. It lists the lunar days which could correspond to the explicit *Tepi Shemu* feast date A; there are six possible years in which LD 1 to 5 (± 1 day) corresponded to A (bold type). (Lunar days are counted forward as positive from lunar day 1 to 15; starting with the last lunar day, whether day 30 or 29, the lunar days are counted backward as negative down to lunar day 16.)

Kruchten identified D as a day of the feast of *Tepi Shemu*.[48] The distance between A and D amounts either to 32 a + 15 d (if 5 Takelot II = 1 Shoshenq III) or to 33 a + 15 d (if 4 Takelot II = 1 Shoshenq III). In the latter case the lunar day of D is ca. 11 days later than that of A, i.e. D is not the date of the *Tepi Shemu* feast, and neither is B or C. In the former case the lunar day of D nearly coincides with that of A; thus A and D are days of the *Tepi Shemu* feast as well as the dates B and C. Table III. 8.5 contains the acceptable and the

[41] J. v. Beckerath, "Beiträge zur Geschichte der Libyerzeit", *GM* 144 (1995), 7–13.
[42] Krauss (n. 15); Krauss, *Sothis*, 168–177, is outdated.
[43] Schott, *Festdaten*, 104–105.
[44] Parker, *Oracle Papyrus*, 7–8.
[45] P. Vernus, "Inscriptions de la Troisième Période Intermédiaire (I)", *BIFAO* 75 (1975), 24; Krauss, *Sothis*, 168–177.
[46] Vernus (n. 45); Kruchten, *Annales*, 244 n. 3.
[47] G. Daressy, *RecTrav* 35 (1913), 130; Kruchten, *Annales*, 239–240: B–D.
[48] Kruchten, *Annales*, 80.—Cf. also Spalinger, "Dating", 393.

Table III. 8.4

11 Takelot II	LD	11 Takelot II	LD	11 Takelot II	LD	11 Takelot II	LD
840	7	834	11	828	15	822	21
839	17	833	–9	827	–5	**821**	**2**
838	–3	**832**	**3**	826	7	820	12
837	8	831	14	825	–11	819	22
836	–12	830	–6	**824**	**–1**	**818**	**4**
835	**–1**	**829**	**5**	823	10	817	14

Table III. 8.5

Takelot II	A	B	C	D	1 Takelot II	A	B	C	D
845	**–1**	**5**	**4**	**1**	**834**	**–1**	**5**	**4**	**–1**
842	3	7	7?8?	3	831	2	7	6	3?
839	5	11	10	6					

Table III. 8.6

Combination	Probability	Combination	Probability
cccc	0.52	c---	0.008
ccc–	0.33	----	0.0003
cc--	0.004		

nearest unacceptable possibilities which result when the lunar day equivalents of the feast dates of Shoshenq III and Petubaste I are also computed and correlated with those of Takelot II within the limits for their first regnal years.

There are only two acceptable alternatives: either 1 Takelot II corresponds to 845 or to 834 BC. In 834 BC two of four lunar dates would have been negatively incorrect (cc--), but in 845 BC there is only one error of this kind (ccc–). Table III. 8.6 lists the probabilities for the combinations of correct (c) and negatively incorrect (–) lunar dates for Luxor as the place where the observations were made (see Table III. 8.2).

1 Takelot II = 845 BC is definitely preferable, because it is far more probable that exactly 1, instead of exactly 2, of 4 lunar dates are too early. If Takelot III = 845 BC, the Julian calendar equivalences for A–D are:

*(A) 11 Takelot II: I Shemu 11	=	LD 30	=	November 25, 835 BC
(B) 7 Petubaste I: I Shemu [1]	=	LD 5	=	November 13, 828 BC
(C) 8 Petubaste I: I Shemu 19	=	LD 4	=	November 11, 827 BC
*(D) 39 Shoshenq III: I Shemu 26	=	LD 1	=	December 2, 803 BC

The figures imply that 1 Shoshenq III = 841 BC and 38 Shoshenq V = 743 BC, so that ca. 21 to 20 years elapsed between 38 Shoshenq V and 6 Bocchoris. (Kitchen maintains that Shoshenq III ruled after Takelot II.[49] Under his premise the *Tepi Shemu* dates A–D result in a single astronomical solution: 1 Takelot II = 856 BC; dead reckoning yields ca. 951/953 BC instead of 945 BC for 1 Shoshenq I which is not acceptable.)

The Lunar wrš *Date in Year 5 of Shoshenq [I]*[50]

The larger Dakhla stela can be ascribed to Shoshenq I with confidence.[51] The text mentions a *wrš* feast on the occasion of a procession of the god Seth on IV Peret 25 in 5 [Shoshenq] I.[52] According to other attestations, *wrš* designates the lunar month and/or a lunar day, possibly day 1: Demotic papyrus CG Cairo 30801;[53] magical papyrus London-Leiden (X 22 and XXI 19);[54] Spiegelberg, Mythus vom Sonnenauge, VIII 20;[55] Ny Carlsberg Tebtunis-Papyri;[56] Demotic Chronicle II,

[49] Kitchen, *TIP*³ XXIII–XXV.—Contra Kitchen, cf. G. F. Broekman, *GM* 205 (2005), 21–33.
[50] For Dyn. 21 see above Jansen-Winkeln, Chapter II.9.
[51] T. L. Sagrillo, *The Reign of Shoshenq I of the Egyptian Twenty-second Dynasty* (Leuven: Dissertation, 2005).—R. Krauss, "Das *wrš*-Datum aus Jahr 5 von Shoshenq [I]", *DE* 62 (2005), 43–48.
[52] A. Gardiner, *JEA* 19 (1933), 19–30.
[53] Parker, *Calendars*, § 89–98; cf. also R. Parker, *A Vienna Demotic Papyrus on Eclipse and Lunar Omina* (Providence: BES 2, 1959), 8–9.
[54] F. Ll. Griffith & H. Thompson, *The Demotic Magical Papyrus of London and Leiden* (London, 1904), 79, 139; J. H. Johnson, in: H. D. Betz, ed., *The Greek Magical Papyri in Translation* (Chicago, 1986), 209, 213, 230.
[55] J. F. Quack, in: *Res severa verum gaudium. Fs für Karl-Theodor Zauzich*, F. Hoffmann & H. J. Thissen, eds., (Leuven: SD 6, 2004), 50–51.
[56] J. Osing, *Hieratische Papyri aus Tebtunis* I. Text (Copenhagen: CNIP 17, 1998), 207–210.

9;[57] building inscription of Parthenios (Moscow stela).[58] Thus it is feasible to search for a match between the date mentioned and a lunar day appropriate for a procession. The sum of the highest attested regnal dates for Osorkon II, Takelot I, Osorkon I, and Shoshenq I, added to 841 BC as year 1 of Shoshenq III, yields 934 BC *at the latest* for year 5 of Shoshenq I. Between 950 and 930 BC, only IV Peret 25 = December 5 in 939 BC is an acceptable match for the *wrš* date as shown in Table III. 8.7. Consequently 1 Shoshenq I began in November 943 BC at the latest, and at the earliest in December 944 BC.

The stela records a judgment on the ownership of a well in Dakhla. According to Gardiner's understanding of the text, the mother of the claimant is mentioned as the owner in a document dated to year 19 of a king Psusennes.[59] Because at least 80 years separate 5 Shoshenq I and 19 Psusennes I, it is unlikely that the document was written in 19 Psusennes I, but rather in 19 Psusennes II.

Three Lunar Dates of the Tepi Shemu Feast in Dyn. 21

Two of the priestly inductions known from Dyn. 21 apparently occurred during the lunar *Tepi Shemu* feast:[60] (a) 2 ʿAkheperreʿ setepenreʿ: I Shemu 20, induction of a man, (b) whose son was inducted in 17 Siamun : I Shemu [1]. E. Young assumed that the two inductions would have been separated by 20 to 30 years, i.e. a generation.[61] Provided that both dates correspond to lunar days 1 to 5,[62] at least 21 y minus 19 d separate them; other astronomical possibilities are 24, 27 and 30 years. The distance of 21 years is methodologically preferable, because young men were inducted when they were 20 years old;[63] furthermore a distance of 21 years yields 6 regnal years for ʿAkheperreʿ setepenreʿ, as in the Manethonian tradition for "Osochor", successor of Amenemope.

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[57] H. Felber, "Die Demotische Chronik", in: *Apokalyptik und Ägypten*, A. Blasius, ed., (Leuven: OLA 107, 2002), 76–77.

[58] W. Spiegelberg, *ZÄS* 66 (1930), 422–443; Borchardt, *Mittel*, 39. Parker, *Calendars*, 18.

[59] Gardiner (n. 52), 28.

[60] Kruchten, *Annales*, 45–48.—Confirmed by Spalinger, "Dating", 393.

[61] E. Young, *JARCE* 2 (1963), 99–111.

[62] Induction date b cannot be later than LD 3, because the 9th lunar month could not begin before IV Peret 28. On the other hand, the distance between induction dates a and b implies that b is 3 to 2 lunar days earlier than a.

[63] Kruchten, *Annales*, 206.

Table III. 8.7

Year BC	IV Peret 25	Year BC	IV Peret 25	Year BC	IV Peret 25
950	LD 2	943	LD–14	936	LD 3
949	12	942	–3	935	13
948	–7	941	9	934	–6
947	5	940	–11	933	5
946	15	**939**	**1**	932	–15
945	–5	938	12	931	–4
944	6	937	–8	930	8

Provided that 1 Shoshenq I = 943 BC and that Psusennes II ruled at least 19 years, induction date b occurred at the earliest in 962 BC.

Table III. 8.8 contains the LD equivalents for dates a and b.[64] Between 981 and 962 BC there are three viable alternatives (bold type). Only one of them is left, if the oracular text no. 6 of Djehutimose is taken into consideration.[65] According to Kruchten, the oracular text implies that the last and fifth day of *Tepi Shemu* fell on I Shemu 10 (or 9 or 8) in year 3 of either Amenemope, Osorkon, or Siamun. If the induction dates (a) and (b) are correctly ascribed to Osorkon and Siamun in relative chronology, then the oracular date would correspond to LD 8–10 in 3 Siamun. It would correspond to LD 15–18 in 3 Amenemope if he ruled 9 full years and a fraction of a year, as usually assumed; the date would correspond to LD 4–6 if 11 years are ascribed to Amenemope. By contrast the oracular date coincides with LD 1 to 5 in year 3 of Osorkon, if induction date (a) corresponds to LD 1 to 5, i.e. the oracular date must be attributed to Osorkon.

In table III. 8.8 only years 970, 973 and 981 BC suit induction date (b) in 17 Siamun, and 990, 993 and 1001 BC for induction date (a) in 2 ʿAkheperreʿ (Osorkon). The corresponding distances between 17 Siamun and 1 Shoshenq I = 943 BC amount to 26, 29 or 37 years. If a reign of 19 years is supposed for Siamun on the basis of Manetho,[66] then 24, 27 or 35 years are possible for Psusennes II. But because Djehutimose oracle date no. 6 does not work with 992 and 1000 BC as year 3 of ʿAkheperreʿ (Osorkon), we are left with 989 BC = 3 ʿAkheperreʿ (Osorkon) as the only possibility.

[64] The distance is throughout 21 years minus 19 days.
[65] J.-M. Kruchten, *Le grand texte oraculaire de Djehoutymose: intendant du domain d'Amon sous le pontificat de Pinedjem* II (Brussels: MRE 5, 1986), 237.
[66] Cf. above Jansen-Winkeln, Chapter II. 9.

Table III. 8.8

17 Siamun	date b	2 Akheperre	date a	3 Akheperre	oracle date
962 BC	LD 28	982 BC	LD 1		
963	18	983	20		
964	7	984	9		
965	26	985	28		
966	15	986	17		
967	4	987	7		
968	23	988	26		
969	12	989	16		
970	**2**	**990**	**5**	**989 BC**	**LD 5 (6?)**
971	21	991	24		
972	11	992	13		
973	**–1**	**993**	**2**	**992**	**LD 4**
974	19	994	21		
975	8	995	10		
976	27	996	29		
977	16	997	19		
978	5	998	8		
979	24	999	27		
980	14	1000	16		
981	**3**	**1001**	**5**	**1000**	**LD 6**

Ramesside Lunar Dates[67]

About 85 years elapsed between 1 Smendes and 10 Amenemope. 200 to 201 years separated the accession of Ramesses II and the latest attestation of Ramesses XI. If these figures are added to 992/991 as year 1 of ʿAkheperre Osorkon, then 1 Ramesses II fell in 1279/1277 BC. The ship's log pLeiden I 350 records a LD 1 that coincided with II peret 27 in 52 Ramesses II; on that day the ship moored in Piramesses, hence the designation Piramesses date.[68] This lunar date can be combined with dates that refer to the feast-of-the-valley.[69] According to *MHC* 135 the feast began on LD 1 in II Shemu. On that day the cult statue of Amun crossed the Nile, went to the temple of Djeser-akhet,[70] toured Deir el-Bahri in a procession, and spent the night in the funer-

[67] For the NK see above Hornung, Chapter II. 8.

[68] J. J. Jansen, *Two Ancient Egyptian Ship's Logs* (Leiden: OMRO Suppl. 42, 1961), 12, 33. Cf. also Beckerath, *Chronologie*, 51.

[69] For a preliminary analysis under the outdated supposition that the reign of Ramesses V extended into a year 5, see Krauss, *Sothis*, 136–144.

[70] *Urk.* IV, 929.

ary temple of the ruling king[71] where Amun received offerings on LD 1 and 2, according to *MHC* 159. Four Dyn. 19/20 graffiti from the Djeser-akhet temple in Deir el Bahri (DB) attest spending the night or receiving offerings in II or III Shemu;[72] the dates imply lunar days 1 or 2.

DB 3: year 7, II Shemu 28; Amun rests in the funerary temple of Twosre[73]
DB 10: year 7, III Shemu 9; Amun rests in the funerary temple of Ramesses III[74]
DB 9: year 6, III Shemu 9; Amun rests in the funerary temple of Wesermare setepen ///[75]
DB 32: year 3, II Shemu 20; Amun rests in the funerary temple of Ramesses II

Combining the Piramesses date with DB 3 and DB 10 allows the chronology between Ramesses II and Twosre to be fixed. [76] According to DB 10 Amun rested in the funerary temple of Ramesses III in a year 7, presumably of Ramesses III himself.[77] The dead-reckoned minimum distance between DB 3 and DB 10 amounts to either 9 years + 11 days or 10 a + 11 d. The astronomically correct distance between DB 3 and DB 10 is 10 a + 11 d = 124 LM − 0.8 d = 3661 days, resulting in a correct LD 2 for DB 10, provided that 1 Ramesses II = 1279 BC. According to oCG 25293 the highest attested dates for Queen Twosre are either IV [prt x] and [I] Shemu [y] or IV [Shemu x] and [IV] Shemu [y] of regnal year 8;[78] thus the queen ruled either 323 ± 15 days or 412 ± 15 days subsequent to the date of DB 3. Sethnakhte ruled into a year 3, corresponding to a reign of at least 731 days or an arithmetical mean of 912 days. There are 2234 days between Ramesses III's accession and DB 10. These distances add up to 323 ± 15 (412 ± 15) days + 731 to 912 days + 22343 days = 3288 ± 15 days to 3558 ± 15 days, approximating the distance of 3661 days between the lunar dates of DB 3 and DB 10.

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[71] Or in the funerary temple of an earlier king, if the ruling king had not yet a temple of his own.
[72] Marciniak, *Inscriptions*.—Peden, *Graffiti*, 106–107, 120–123.
[73] *KRI* IV 376.
[74] *KRI* V 337.
[75] *KRI* VI 102; but cf. Peden, *Graffiti*, 122 n. 395.
[76] For details, see R. Krauss, *SAK* 24 (1997), 175–177.
[77] Thus also *KRI* IV, 376.—Cf. table III. 10.10 for the astronomical possibility that DB 10 belongs to Ramesses VII.
[78] Beckerath, *Chronologie NR*, 74–76.

If Amenmesses was a usurper in control of Nubia and UE in the mid-reign of Sety II, then the interval between the Piramesses date and DB 3 amounts to 36 a +121 d = 449 LM + 2 d. This figure corresponds to the proper interval between a first LD and a LD 1–2 as a feast-of-the-valley date (± 1 day). If, by contrast, the interval between the two dates is lengthened by a chronologically independent 4 year reign of Amenmesses, then the interval amounts to 40 a + 121 d = 498 LM + 15 d: then DB 3 would correspond to a LD 15 (full moon), but not to a LD 1 or 2 as expected. If the distance is shortened, then DB 3 would coincide with a LD 5 or 23. It follows that the reign of Sety II subsumes that of Amenmesses.

Table III. 8.9 presents astronomically possible years for DB 3, 9, 10, and 32, provided that 1 Ramesses II = 1279 BC and that the only unresolved issue in Ramesside chronology is whether Ramesses' VII reign extended into a year 9 and/or Ramesses' VIII reign into a year 2. Possible years are also given for DB 31, a graffito dated to year 22, II Shemu 22 (*sic*); written "during the feast-of-the-valley". Since neither the resting of Amun nor offerings to him are mentioned, it is unclear whether the date can be considered to be a LD 1–2.

Table III. 8.9 demonstrates that DB 9 is attributable to Siptah (sic) and DB 32 to Ramesses VI, whereas DB 10 could be a date of Ramesses III or VII. The attribution of DB 31 to Ramesses XI is problematic, because a rock fall might have already destroyed Djeser-akhet during his reign.[79] If attributed to Ramesses II, then the date relates to a LD 3 which might have been a feast day in early Dyn. 19. If attributed to Ramesses III, "during the feast-of-the-valley" could relate to all of (lunar) II Shemu as the month of the feast. The Julian calendar equivalents for the lunar days of the graffiti are:

DB 9: III Shemu 9, Year 6 [Siptah]:	LD 2: April 21, 1192 BC
DB 3: II Shemu 28, Year 7, Twosre:	LD 2: April 10, 1191
DB 10: III Shemu 9, Year 7, [Ramesses III]:	LD 2: April 18, 1181
DB 32: II Shemu 20, Year 3 [Ramesses VI]:	LD 2: March 21, 1143
[DB 31: II Schemu 22, Year 22 [Ramesses XI]:	LD 2: March 8, 1085]

79 Cf. J. Lipinska, *JEA* 53 (1957), 28–30; G. Pinch, *Votive Offerings to Hathor* (Oxford, 1993), 10–11.

Table III. 8.9

Ruler	DB 3	DB 9	DB 10	DB 32	DB 31
Ramesses II		27	–	7	3
Merneptah		20	–	28	–
Sety II		27	–	6	–
Amenmesses		–	–	27	–
Siptah		**2**	–	10	–
Twosre	**2**	–	–	–	–
Sethnakhte		–	–	25	–
Ramesses III		21	**2**	28	26
Ramesses IV		6	–	14	–
Ramesses V		–	–	19	–
Ramesses VI		24	5	**2**	–
Ramesses VII		20	**1**	28	**–**
Ramesses VIII		–	–	–	–
Ramesses IX		27	9	6	–
Ramesses X		–	–	20	–
Ramesses XI		25	6	4	**2**

The DB-graffiti document the feast-of-the-valley in II and III Shemu, whereas in *MHC* 135+159, only II Shemu is mentioned. As Table III. 8.10 shows, the feast dates fall in LM 11 or 10. The respective LM could have been determined by the beginning of the first lunar month within the civil year. The feast might have begun on LD 1 in LM 11, if the first LM in the civil year began on I Akhet 15 at the latest; if after I Akhet 15, then the feast began on LD 1 in LM 10. The reference to II Shemu in *MHC* might reflect the situation in the year when the calendar was devised.

The lunar dates of DB 3, 9, 10 and 32 (DB 31 being not considered) are astronomically only compatible with 1 Ramesses II = 1314 or 1279 BC. In Table III. 8.11 all alternatives between 1304 and 1265 BC are tested. If 1 Ramesses II were 1290 or 1265 BC, then the DB graffiti dates would coincide with LD 3–4 (positive errors), instead of LD 1–2. If 1 Ramesses II were 1268 BC, the graffiti dates would correspond to LD 1–2, but the Piramesses date would be off by +2 days (positive error). It follows that only 1304 and 1279 BC are astronomically possible for 1 Ramesses II. But 1304 BC is excluded on the basis of the relative chronology of Dyns. 19 to 21, whereas 1279 BC accords.[80]

[80] Thus the observation of the Piramesses date was negatively incorrect, and for that reason A. Dodson (BiOr 57, 2000, 51 n. 5) suggested 1265 BC as year 1 of Ramesses

Table III. 8.10

Graffito	LD 2	LM	LD 1 of LM 1	Graffito	LD 2	LM	LD 1 of LM 1
DB 9	III S 9	11	I A 13	DB 32	II S 20	10	I A 23
DB 3	II S 28	11	I A 2				
DB 10	III S 9	11	I A 1				

Table III. 8.11

1 Ramesses II	LD of Pir	LD of DB 3	LD of DB 10	LD of Graffito Year 34	LD of Graffito Year 47
1304 BC	−1	2	1	4	4
1290	2	3	2	6	5
1279	−1	2	2	4	4
1268	−2	1	−1	4	3
1265	1	3	2	6	5

Supplementary Lunar Dates

A visitor's graffito, written at a pyramid in Saqqara on IV Shemu 24, in 34 Ramesses II attests the "day of the feast of Ptah-south-of-his-wall";[81] Peden presumed that the feast day was a public holiday.[82] The distance between it and the Piramesses date shows that the feast day coincided with LD 4 or *peret Sem*, appropriate for a feast day of Memphite Ptah whose main priest was the *Sem*.[83] Another visitor's graffito from Saqqara attests two Memphite officials enjoying a stroll (*swtwt*) on II peret 25 in 47 Ramesses II.[84] The absence from work of a treasury-scribe and a scribe of the vizier predicates a public holiday. The dates of these two graffiti coincide with the same lunar day and thus support, but do not prove that 1 Ramesses II = 1279 BC.

II, or 1214 BC respectively as year of the Piramesses date when the observation would have been correct. But Egyptologists should be prepared to find now and then a negatively incorrect lunar date in their sources.

[81] G. Jéquier, *Deux pyramides du Moyen Empire. Fouilles à Saqqarah* (Cairo, 1933), 13–15; *KRI* III, 436.

[82] Peden, *Graffiti*, 98–99.

[83] L. Borchardt, *ZÄS* 70 (1934), 97–98, 100 n. 9; idem, *Mittel*, 52, speculated that the date was related to full moon.

[84] Firth & Quibell, *Step Pyramid* I, 82–83; KRI III, 148; cf. Peden, *Graffiti*, 99.

A Lunar Date for the Foundation of Amarna?

R. A. Wells presumed that the axis of the Small Temple at Amarna (*Ḥwt Jtn*) was aligned towards the sun when it rose over the entrance to the royal wadi on IV Peret 13 in 5 Akhenaten.[85] On that day the king took an oath to found Akhetaten.[86] It may be presumed that Akhenaten's oath was followed by a foundation ceremony. If the ceremony took place on a LD 1 (attested for an earlier foundation ceremony of Thutmose III at Karnak (see below) and a later one of Ramesses II at Luxor),[87] then the year would have been 1348 BC, when IV Peret 14 (March 6 Jul) coincided with a LD 1.[88]

The Lunar Date of Amenhotep II

According to pSt. Petersburg 1116A, grain to brew beer for consumption on a LD1 was allotted at the earliest on III Shemu 6 and at the latest on III Shemu 9 in year 19 or 20 [of Amenhotep II]. Reckoning from the lunar dates of Thutmose III, Beckerath concluded that the LD 1 occurred close to III Shemu 9, provided (1) the papyrus dates to year 20, and (2) there was no coregency of Thutmose III and Amenhotep II.[89] Parker objected to Beckerath's conclusions on the following grounds:[90] 1) In early 19th century Nubia brewing beer took 3 to 4 days. If 1 Thutmose III = 1490 BC and if there was no coregency, then 20 Amenhotep = 1417 BC. In that year LD 1 fell on III Shemu 8, providing insufficient time for brewing beer. 2) Grain of year 18 was allotted before II Shemu 17, a date corresponding to the beginning of May (Greg.) around 1400 BC, when grain from the harvest of the current year would have been available, the harvest being over before May (Greg.). It is not to be expected that grain of year 18 would still be in the granaries after the harvest of year 20 became available. Therefore the papyrus should date to year 19.

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85 R. A. Wells, *SAK* 14 (1987), 313–333; idem, *GM* 108 (1989), 87–90.
86 Murnane & van Siclen, *Stelae*, 38–40, 48.
87 D. B. Redford, *JEA* 57 (1971), 114; cf. *KRI* III, 346.
88 R. Krauss, *GM* 103 (1988), 44.
89 J.v. Beckerath, *ZDMG* 118 (1967), 18–21.
90 R. Parker, "Once again the Coregency of Thutmose III and Amenhotep II", in: *Studies in Honor of John A. Wilson* (Chicago: SAOC 35, 1969), 75–82; accepted by Beckerath, *Chronologie NR*, 44; idem, *Chronologie*, 43–44.

Parker's arguments are invalid. The NK sources oCG 25780; 8 and oCG 25782; 4, 7 report consumption of beer on the day after brewing.[91] The grain harvest actually continued well into May (Greg.); at the beginning of the month deliveries from the new harvest would not yet have arrived at the granaries.[92] Thus it is quite possible that pSt. Petersburg 1116A dates to year 20 of Amenhotep II. Provided 1 Thutmose III = 1479 BC, the alternatives for a LD 1 close to III Shemu 10 in 20 Amenhotep II are as shown in Table III. 8.12.

If the papyrus dates to year 19, then there was a coregency which lasted for 2y + 4m. But if to year 20, then there was a coregency of only four months. There was no coregency at all, if the death date of Thutmose III in the tomb of Amenemheb (TT 85) is emended from III Peret 30 to III *Akhet 30 to conform with IV Akhet 1 as accession date of Amenhotep II.

Lunar Dates of Thutmose III

In 1957 Parker computed the possible solutions for the Akhmenu foundation date under the traditional assumption that it took place in 24 Thutmose III on II peret 30, the day being a LD 1.[93] In 1975 Wente argued that only the order for preparing the foundation ritual was given on II peret 30 and that LD 1 occurred on III peret 1;[94] Parker criticized Wente's interpretation.[95] In 1986 Beckerath published a new translation of the text, based on a more complete copy.[96] He concluded that

Table III. 8.12

year of Amenhotep II	LD 1 in III Shemu	duration of coregency
19 = 1409 BC	11	2 years + 4 months
20 = 1406 BC	9	4 months or none

[91] R. Krauss, *OLZ* 90 (1995), 241–242.
[92] Cf. also Beckerath, *Chronologie*, 53.
[93] R. A. Parker, *JNES* 16 (1957), 39–43.
[94] E. F. Wente, "Thutmose III's accession and the beginning of the New Kingdom", *JNES* 34 (1975), 265–272.
[95] Parker, in: W. K. Simpson, *Studies Dunham*, 146–148.
[96] J. v. Beckerath, "Ein Wunder des Amun bei der Tempelgründung in Karnak", *MDAIK* 37 (1981), 41–49.

the order for the foundation ritual was given on II peret 30 and that the ritual took place on the same day. In other words, if the proper day for the ritual was a LD 1, then the text implies that II Peret 30 was a LD 1.[97] Parker, Wente and Beckerath relied on astronomical calculations that were based on the slightly outdated parameters of P. V. Neugebauer.[98] According to computation with modern parameters, II Peret 30 was a LD 1 rather than an old crescent day in 1455 BC as year 24 of Thutmose III, corresponding to 1 Thutmose III = 1479 BC. We do justice to both uncertainties by reckoning with II Peret 30 as well as III Peret 1, as possible first lunar days.

The date of the Battle of Megiddo is (*Urk.* IV, 657): *rnpt-zp 23, tpy šmw sw 21, hrw ḥ3b n psḏntjw r-mtj*:[99] "Regnal year 23, I Shemu 21, day of the feast of lunar day 1, exactly." Although the text asserts the exact coincidence of the civil date and a LD 1, Parker accepted Faulkner's argument for emending the day to I Shemu 20.[100] Faulkner had pointed out that Thutmose III arrived at Megiddo on I Shemu 19 and thus the battle "should" have taken place on the next day, I Shemu 20, a day that is not mentioned in the report. By contrast, Wente maintained that Helck "convincingly" demonstrated that no such emendation of the text is required.[101] Whereas Beckerath accepted Wente's judgment, Parker cited Spalinger who he believed had shown that "Helck's argument lacks foundation."[102] Under these circumstances it is advisable to procede using both possible dates for the Battle of Megiddo.

Table III. 8.13 shows that there are two astronomically workable possibilities: Either 1 Thutmose III = 1479 BC (Megiddo date = I Shemu 21, Karnak date = II Peret 30 or III Peret 1), or 1 Thutmose III = 1504 BC (Megiddo date = I Shemu 20, Karnak date = III Peret 1). It is impossible to reconcile 1 Thutmose III = 1504 BC with 1 Ramesses II = 1279 BC and 9 Amenhotep I = 1506 BC (see chapter III. 10); thus only 1 Thutmose III = 1479 BC remains. In that case

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97 Cf. most recently Spalinger, "Dating", 387–390.

98 Parker did his own computations; Wente used Parker's computations. Beckerath asked for the assistance of astronomers who also used Neugebauer's Tables; there are (copying?) mistakes in Beckerath's figures.

99 For the "exact" feast of (lunar) *wrš*, see Quack (n. 55), 472.

100 Parker, *Calendars*, 73; cf. idem, *JNES* 16 (1956), 40, referring to R. O. Faulkner, *JEA* 28 (1942), 4; 11.

101 E. F. Wente, *JNES* 34 (1975), 265, referring to W. Helck, *MDAIK* 28 (1972), 101–102; see also J. v. Beckerath, *MDAIK* 37 (1981), 49 n. 18.

102 Parker (n. 95), 146, citing A. J. Spalinger, *MDAIK* 30 (1974), 221–229.

the battle was fought on I Shemu 21. The text's assertion that the date corresponded to a LD 1 "exactly" can imply that both armies waited for the moon's invisibility to go to battle.

The Lunar Date of the Ebers Calendar

According to the interpretation of both Parker and Hornung, the rising of Sothis and the first day of the lunar month *wep renpet* coincided in regnal year 9 of Amenhotep I on III Shemu 9. As argued below in chapter III. 10, it is highly likely that this is correct. Nevertheless, for now we shall refrain from using III Shemu 9 in 9 Amenhotep I as a LD 1.

The Monthu Feast in pBoulaq 18 as a Lunar Date[103]

Gardiner, Borchardt[104] and Quirke read the royal name in pBoulaq 18/L as [*Sbk*]-*ḥtp* and in pBoulaq 18/S as *Jmn-m-ḥ3t sbk-ḥtp*,[105] identifying this king with Sobekhotep II, the predecessor of Khendjer according to *TC*. By contrast, Ryholt recognizes only "doubtful traces", arguing that the *TC*'s Sobekhotep II was in fact the first ruler of Dyn. 13.[106] pBoulaq 18/L,S/ attests a vizier Ankhew who is a known contemporary of Khendjer. By the reign of Sobekhotep III, Ankhew's son Ressonb

Table III. 8.13

1 Th III	LD of I Shemu 21	Error	LD of I Shemu 20	Error	LD of II Peret 30	Error	LD of III Peret 1	Error
1504 BC	2	–	1	0	–1	+	1	0
1493	–1	+	–2	++	–2	++	–1	+
1490	2	–	1	0	2	–	3	– –
1479	1	0	–1	+	1?	0?	1??	0??
1468	1	0	–1	+	–2	++	–1	+
1465	2	–	1	0	2	–	3	– –

[103] For the MK and SIP, see above Schneider, Chapter II. 7.
[104] Cf. Beckerath, *Zwischenzeit*, 47–49.
[105] S. Quirke, *The Administration of Egypt in the Late Middle Kingdom* (Whitstable, 1990), 27 n. 12.
[106] Ryholt, *Situation*, 319.—Cf. above Schneider, Chapter II. 7.

had succeeded him as vizier, and thus pBoulaq 18 and the other sources that mention Ankhew can be dated prior to Sobekhotep III.[107] The attribution of pBoulaq 18 to one of the kings between Khendjer and Sobekhotep III (Seth, Inyotef V or Imiramesha)[108] is contradicted by the poor documentation for these kings.[109] Thus it is preferable to date pBoulaq 18 to Khendjer's immediate predecessor, be he Sobekhotep II or not.

According to pBoulaq 18/L, in Medamud a Monthu feast was celebrated on III Akhet 17 and 18 in year 3 of the predecessor of Khendjer.[110] A Monthu feast is also attested in the Illahun archive. The instances are dated to II Akhet 14 and 22 respectively[111] and coincided with *ḫnp-šʿw*, a feast on lunar day 2.[112] Provided the Monthu feast of Boulaq 18 on III Akhet 17 was also celebrated on lunar day 2, the difference of one civil month can be explained like the shift of the *wꜣgj* feast in the Illahun archive: it shifted during the reigns of Senwosret III and Amenemhet III from II to III Shemu; presumably it took place in the 2nd lunar month after *peret Sepdet*.[113] If, for example, the Monthu feast was fixed on LD 2 of the 7th lunar month after *peret Sepdet*, then it would have taken place mostly in II Akhet during Dyn. 12, but never before III Akhet 1 during Dyn. 13.

For an estimate of the period of pBoulaq 18 we rely provisionally on the *TC* and the *stèle juridique*. Provided 1 ʿAhmose = 1539/34 BC, the figures of the *TC* and the few preserved regnal dates yield 1591/86 BC at the latest for year 1 of Sewadjenreʿ Nebiriau I. The genealogical and historical information contained in the text of the *stèle juridique* indicates an interval of ca. 55 ± 15 years between the first years of Sewadjenreʿ and Merhetepreʿ Ini.[114] Considering ca. 2 more years for the immediate predecessor of Khendjer,[115] 5 years for Khendjer,[116] 8

[107] Ryholt, *Situation*, 193, 243.
[108] Ryholt, *Situation*, 194, 244.
[109] Cf. Ryholt, *Situation*, 342.
[110] A. Scharff, *ZÄS* 57 (1922), 63.
[111] Luft, *Fixierung*, 97–99, 114–118, 170.
[112] Cf. Luft, *Fixierung*, 29, 111, 118 (pBerlin 10001, 10248 and 10282); cf. also Krauss, *GM* 138 (1994), 84–85.
[113] Krauss, *Sothis*, 94.
[114] Beckerath, *Untersuchungen*, 182; Ryholt, *Situation*, 233–234.
[115] Provided that year 5 of pBoulaq 18/S belongs to the same reign as pBoulaq 18/L with the Monthu feast in year 3; cf. Ryholt, *Situation*, 194 with n. 688.
[116] Control note in the pyramid of Khendjer, cf. Ryholt, *Situation*, 193–195.

to 9 years for Sobekhotep IV,[117] and the figures in the *TC* for Sobekhotep III through Merhetepreʿ Ini, the distance between regnal year 3 of pBoulaq 18 and year 1 of Merhetepreʿ Ini amounts to ca. 65 to 67 years. Thus regnal year 3 of pBoulaq 18 fell *at the latest* in 1712/07 BC ± 16 years. III Akhet 17, the date of the Monthu feast coincided with a LD 2 in 1745, 1734 and 1684 BC.[118] The regnal years that are preserved in the *TC* between Wegaf and the predecessor of Khendjer add up to 8 to 14 years at least; the regnal years of ca. 8 kings are lost. Thus nothing prohibits equating year 3 of pBoulaq 18 with 1734 BC, provided the last year of Dyn. 12 corresponds to ca. 1760 BC (see next paragraph).

The Illahun Lunar Dates (ILD)

In 1992 Luft presented the lunar dates that are contained in the Illahun archive,[119] relying on earlier studies of Borchardt, Dévaud, Möller, Parker and Kaplony-Heckel. Details of Luft's original presentation have been corrected in the following list.[120] 21 Illahun lunar dates (ILD) are useful for chronological analysis:

ILD 1: pBerlin 10003; 9 [Senwosret III]
ILD 2: pBerlin 10248; 14 Senwosret III
ILD 3: pBerlin 10016; 18 [Senwosret III]
ILD 4: pBerlin 10090; 3 [Amenemhet III]
ILD 5: pBerlin 10056 A; 8 [Amenemhet III]
ILD 6: pCairo 58065; 9 [Amenemhet III]
ILD 7: pBerlin 10103; 29 [Amenemhet III]
ILD 8–19: pBerlin 10056; 30/31 [Amenemhet III]
ILD 20–21: pBerlin 10006; 32 [Amenemhet III]

[117] W. K. Simpson, *MDAIK* 25 (1969), 154–158.
[118] In 1709 BC a LD 1 coincided either with III Akhet 15 or 16, resulting in III Akhet 17 being a LD 3 or 2.
[119] Luft, *Fixierung*.
[120] Krauss, in: Bietak, *SCIEM Haindorf 2001*, 175–178.

Commentary

ILD 1: Report of the 4th phyle that withdraws from monthly temple service and of the 1st phyle that takes over. Luft dates the protocol to [III Peret 9], the day before the first preserved dated entry. This is confirmed by the distances between III Peret 9 in 9 Senwosret III and ILD 3, 5, and 6.

ILD 2: copy of a letter announcing two festivals: one on II Akhet 18, corresponding to LD 2, and another on II Akhet 20, corresponding to LD 4. According to Luft the letter might have arrived on II Akhet 16, i.e. one day *before* the lunar month that is referred to would have begun. Therefore it possible that the lunar dates do not correspond to observation, but to expectation and are off by one day.

ILD 3: letter concerning the moveable *wꜣgj* festival. After II Shemu 17, the date of *wꜣgj*, there is added: "*2-nw n mḏḏj-nt* = the second (day) of LD 15". Evidently the addendum identifies the date of *wꜣgj* as LD 17. Thus II Shemu 17 coincided with LD 17 as the day of *wꜣgj*, and the corresponding LD 1 was II Shemu 1.

ILD 6: list of offerings for the *Wagi* festival. Here *Wagi* coincided with II Shemu 29; if it were LD 17, then the corresponding LD 1 was II Shemu 13.

ILD 4: The entries mention offerings on III Shemu 15, followed by "*sw3 ḥr* III Shemu 16" in turn followed by "LD 1".[121] According to Luft "*sw3 ḥr* III Shemu 16" means that III Shemu 16 was skipped.[122] If so, the LD 1 mentioned after III Shemu 16 has to be III Shemu 17.[123]

ILD 5: list of offerings, including those made in year 8.[124] Luft recognized the date IV Akhet 26 in year 8 as a LD 1.[125]

ILD 7: In a letter dated I Shemu 15, an official complains that a LD 9 had occurred, without the delivery of a bull for an offering which had been due. Luft argued that the non-delivery should have prompted an immediate reaction, "so that in view of the small distances between the offices the 9th lunar day in all probability coincided with I Shemu 15", i.e. LD 1 would fall on I Shemu 7.

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121 Luft, *Fixierung*, 86–88.
122 Luft, *Fixierung*, 86 ff.
123 R. Krauss, *OLZ* 89 (1994), 10.
124 Luft, *Fixierung*, 70–73.
125 R. Krauss, *GM* 138 (1994), 82–83.

ILD 8–19: account for a "year" (*rnpt*) overlapping regnal years (*rnpt zp*) 30 and 31 of Amenemhet III. Borchardt recognized this "year" (*rnpt*) as a lunar year of 354 days with the account covering the months 2, 4, 6, 8, 10 and 12. The lunar intervals of 29 or 30 days are indicated by first and last dates linked by *nfrjjt-r* (until):

II Shemu 26 *nfrjjt-r* III Shemu 25
IV Shemu 25 *nfrjjt-r* year 31, I Akhet 1[9]
year 31, II Akhet 20 *nfrjjt-r* III Akhet 19
IV Akhet 1[9] *nfrjjt-r I* Peret 18
II Peret 18 *nfrjjt-r* III Peret 17
IV Peret 17 *nfrjjt-r* I Shemu 16

Parker interpreted the dates before *nfrjjt-r* as first days, and the ones after as last days of an Egyptian lunar month.[126] Reckoning the distances between ILD 8–19 and the other ILD, Luft realized that "LD 2 *nfrjjt-r* LD1" is meant.[127]

ILD 20–21: Rt III of pBerlin 10006 contains an account for the 29 days from II Akhet 9 to III Akhet 7 in 32 [Amenemhet III]; the interval is called a "month" (*3bd*).[128] According to Luft, this "month" designates a lunar month of temple service which started on a LD 2 and ended on a LD 1. Rt II records the delivery of offerings for LD 1 and 2 and III Akhet 6 and 7. Parker presumed that the dates coincided with the lunar days;[129] according to Luft, the deliveries were one day ahead.

Reckoning the distance between the lunar dates shows that the ILD derive from two different reigns, one of them included ILD 1, 2 and 3 from regnal years 9, 14 and 18 of a king who ruled 19 years and who is clearly Senwosret III. The remaining lunar dates come from regnal years 3, 8, 9, 29, 30/31 and 32 of a different king who is just as clearly Amenemhet III. In the context of the Illahun archive, these reigns can only be arranged as a reign of at least 32 years that succeeded a reign of 19 years. Whether or not Senwosret III took Amenemhet III as coregent at the end of his regnal year 19 is irrelevant since the following regnal years were counted as Amenemhet III's (see above

[126] Parker, *Calendars*, 64, after Wheeler.
[127] Luft, *Fixierung*, 233–234.
[128] Luft, *Fixierung*, 42–44.
[129] Parker, *Calendars*, 63.

Schneider, Chapter II. 7). Thus the ILD span a period of 42 calendar years; the earliest is 9 Senwosret III, the latest is 32 Amenemhet III. The ILD constitute a set of interconnected lunar dates. If one of them is ascribed to a certain year BC, the others follow. The set can be expressed either in relation to 1 Senwosret III or 1 Amenemhet III. As demonstrated above, the astronomically correct solution is 1 Senwosret III = 1837/36 BC and 1 Amenemhet III = 1819/1818 BC.

In 6 Senwosret III the temple service was organized by civil months; the phyles were not numbered, but named after civil months.[130] Three years later, in 9 Senwosret III, ILD 1 attests temple service by lunar months, beginning on LD 1. Some 40 years later, in years 30–32 of Amenemhet III, the monthly temple service started on a LD 2 and ended on a LD 1 as Luft has recognized. It is clear that the lunar month itself and the counting of its days were not affected by the changes within the temple service. Nevertheless, when analysing the ILD, there are two sets of dates: a) ILD 8–21, dependent on the beginning of the temple service in the lunar month and b) ILD 1–7, independent of it. If 1 Amenemhet III = 1869/68 BC, then six dates of ILD 1–7 are correct and one is positively incorrect, yielding $p = 0.05$. If 1 Amenemhet III = 1844/43 BC then of ILD 1–7 six dates are correct and one is negatively incorrect, yielding $p = 0.32$. Thus 1 Amenemhet III = 1844/43 BC is preferable over 1 Amenemhet III = 1869/68 BC.[131]

The Khozam Lunar Date

The inscription Cairo JE 43290 equates IV Akhet 25 in year [1] of an unnamed [Herakleopolitan] king with lunar day 15.[132] Fischer associated the inscription with Khozam (Coptos) and dated it to the last years of the Herakleopolitan's hold over the Coptite nome, i.e. to the early years of Dyn. 11.[133] Dead reckoning yields 2046 BC *at the very latest* for the beginning of Dyn. 11. The regnal years of the kings of early Dyn. 12 are well attested; nevertheless, there is the problem of

[130] pBerlin 1050; cf. L. Borchardt, *ZÄS* 41 (1904), 35–36; Luft, *Fixierung*, 65–67.
[131] Cf. Figures III. 8.1–2.—The probabilities for ILD 8–21 are correspondingly $p = 0.16$ and $p = 0.014$.
[132] Goedicke, *MDAIK* 50 (1994), 72; see above Baud, Chapter II. 5.
[133] Fischer, in: Manuelian, *Studies Simpson*, 267–270.

the historicity of coregencies during the first four reigns. Uncertainties amount to 16 years, and thus 1 Amenemhet I is either 1940 BC or 1956 BC, if 1 Senwosret III is 1837/36 BC.

The highest attested dates for Dyn. 11 yield 106 years. There are no regnal years preserved for three rulers, and for at least three others, the highest attested dates are presumably different from their last regnal years. Thus dead reckoning implies a date *well before* 2046 or 2062 BC for the beginning of Dyn. 11.

The total of 143 years in the *TC* for 6 kings of Dyn. 11 represents a tradition that goes back to the common source of *TC* and Manetho: Manetho's 16 kings of Dyn. 11 who ruled for 43 years are clearly secondarily garbled from 6 kings ruling 143 years. The highest attested dates do not contradict the figures in *TC*, although it gives 49 years for Horus Wah-ankh Inyotef II, whereas the date of the so-called dog-stela is his year 50; presumably the *TC* rounded off from 49 y + x m + y d. The total of 143 years seems to be of correct magnitude, but it might be incorrect in detail, if only a few years are missing because the figures are rounded off.[134] Addition of the *TC*'s 143 years to 1 Amenemhet I = 1940/39 or 1956/55 BC yields 2083/82 or 2099/98 BC for the beginning of Dyn. 11. These figures must be reconciled with the Khozam lunar date that corresponds to the following absolute dates as shown in Table III. 8.14:

Table III. 8.14

Year BC	LD of IV Akhet 25	Year BC	LD of IV Akhet 25
2053	**15**	2092	14
2064	16	**2103**	**15**
2067	14	2114	16
2078	**15**	2117	14
2089	16	**2128**	**15**

2053 BC, the earliest astronomical possibility for the Khozam lunar date, is historically too early. The years 2078, 2089, and 2103 BC are compatible with the suppositions made here about Dyns. 12 and 11.[135]

[134] K. Ryholt, *Ä&L* 14 (2004), 152.
[135] The year 2092 BC should not be considered, because it would imply a positively incorrect lunar date.

Lunar Dates of Late Dyn. 5[136]

Analysis of the lunar dates preserved in the Neferirkareʿ archive presupposes an estimate of the minimum distance between Dyns. 6 and 11. We rely on the judicious estimate of Hayes and Fischer that the FIP lasted between 30 and 40 years.[137] Baud estimates a "generation" or ca. 30 years for Dyn. 8 and at least 83 to 85 years for Dyn. 6 (if only the attested (*m-*)*ḫt zp* years are considered) or a minimum of 147 to 153 years (assuming a regular biennial count). He notices the imbalance of *zp* years and (*m-*)*ḫt* zp years during the reign of Pepy II, but tends to accept a regular biennial count throughout Dyn. 6 nevertheless (see above, Chapter II. 5).

Baud's point of view is supported by the following argument. From all of Dyn. 6, 10 *m-ḫt zp* years and 12 *zp* years are preserved. At least 72 *zp* years actually occurred, i.e. 83.3% of the *zp* years are missing from the record. There is no reason why more or less *m-ḫt zp* years than *zp* years should be missing. Thus it is likely that at most 60% of the regnal years of Dyn. 6 were *zp* years and at least ca. 40% *m-ḫt zp* years; if so, *at least* 120 to 144 regnal years must be attributed to Dyn. 6, implying a regular biennial count and thus the dynasty's duration for 147/153 years.[138] If the Khozam lunar date corresponds to 2078 or 2103 BC, our figures for the FIP, and Dyns. 6 and 8, result in ca. 2293 or 2318 BC at the latest for the first year of Dyn. 6.

The highest date for Wenis is IV Shemu in *rnpt zp* 8,[139] corresponding to regnal year 16 at most. If Wenis reigned for 16 years, his year 1 fell between ca. 2334 and 2309 BC at the latest, whereas a 44 year reign of Isesi would have begun between 2378 and 2353 BC.

Posener-Kriéger identified two lunar dates in the Neferirkareʿ archive:[140] (I) pLouvre E.25279 recto: LD 1 and 2 = IV Shemu 17 and 18, corresponding to the year before *rnpt zp* 4 that is mentioned on the verso, i.e. regnal year 7 or 6;[141] (II) pBM 10735 recto: II Shemu 18, statue

[136] For Dyns. 4 to 5, see above Verner, Chapter II. 4.

[137] W. C. Hayes, "The Middle Kingdom in Egypt: Internal History from the Rise of the Heracleopolitans to the Death of Ammenemes III", (*CAH* I.3, 1961), 4–5.—H. G. Fischer, *Inscriptions from the Coptite Nome* (Rome, 1964), 42.

[138] This yields a total of ca. 183 years for Dyns. 6 and 8 which is reminiscent of the total of (181 + 6) years + 6 monhts + 3 days in TC.

[139] Posener-Kriéger, *Archives* II, 491.

[140] Posener-Kriéger, *Archives* II, 486–488.

[141] As a rule the first count occurred after rnpt zmA tAwj; for an exception see Baud, "Ménès", 125. Thus the year before rnpt zp 4 is regnal year 7, rather than 6.

ritual = LD 2.[142] The verso is dated to *rnpt zp* 21 or rather 22; i.e. regnal year 42 or rather 44, if the count was biennial.[143]

There are two models for interpreting the lunar dates I and II. In model A lunar date I belongs to 7 Izezi and II belongs to year 21 of Izezi. In model B lunar date I belongs to 7 Wenis and II occurred 11, 25, or 36 years earlier, corresponding to year 15, 26 or 40 of Isesi, provided he ruled for 44 years. If so, then in relative chronological terms at least ca. 250 years elapsed between his year 7 and the Khozam lunar date. Only 261 y + 119 d or 286 y + 119 d are proper lunar distances for model A. Table III. 8.15 contains the possibilities for 1 Isesi between 2393 and 2335 BC, if model A is followed. The only astronomically viable possibility would be 7 Isesi = 2346 BC and 21 Isesi = 2325 BC, implying 208 years between year 1 of Dyn. 6 and 2078 BC for the Khozam lunar date, or 183 years, if the Khozam lunar date corresponds to 2103 BC. Both intervals are apparently too short and thus model A does not seem to work, in harmony with Posener-Krieger's slight preference of model B over A,[144] which we share.

For model B only 211 y, 236 y, or 261 y (+ 119 d each) are proper lunar distances. Table III. 8.16 contains the possibilities for 1 Wenis between 2382 and 2296 BC and the corresponding earlier years of Izezi.

Table III. 8.15

Izezi Year 1	Izezi Year 7	LD 1 in IV Shemu	Izezi Year 21	LD 2 in II Shemu
2335	2328	19	2314	19
2346	**2339**	**17?18?**	**2325**	**18**
2357	2350	16	2336	17
2360	2353	18	2339	20
2371	2364	18	2350	18
2382	2375	16	2361	17
2385	2378	19	2364	20
2393	2386	15	2372	16

142 Posener-Kriéger, *Archives* I, 52–54.
143 See above Verner, Chapter II. 4.
144 Posener-Kriéger, *Archives* II, 487.

Table III. 8.16

Wenis Year 1	'7 Wenis' LD 1 in IV Shemu	'40 Izezi' LD 2 in II Shemu	'26 Izezi' LD 2 in II Shemu	'15 Izezi' LD 2 in II Shemu
2296	'2289'	'2300'	'2314'	'2325'
17	**18**	19	**18**	
2321	'2314'	'2325'	'2339'	'2350'
	17	**18**	20	**18**
2346	'2339'	'2350'	'2364'	'2375'
	17? 18?	**18**	20	19
2371	'2364'	'2375'	'2389'	'2400'
	18	19	19? 20?	19
2382	'2375'	'2386'	'2400'	'2411'
	16	17	19	17

Model B allows for three astronomically workable possibilities for year 7 of Wenis. Of them 2289 BC implies unacceptable 200 years between year 1 of Dyn. 6 and 2078 BC for the Khozam lunar date. The remaining possibilities for 7 Wenis are 2314 or 2339 BC; they imply acceptable 225 years between year 1 of Dyn. 6 and the Khozam lunar date of 2078 or 2103 BC. Thus the earliest lunar dates that are available for chronological analysis yield two possibilities for the end of Dyn. 5 which are 25 Egyptian years or a lunar cycle apart.

III. 9 THE HELIACAL RISING OF SIRIUS

Teije de Jong

The heliacal rising of Sirius, the brightest star in the sky, was used in antiquity, both in Egypt and in Mesopotamia, to synchronize the calendar to the solar year. On the day of its heliacal rising Sirius is seen again for the first time in the morning twilight sky after having been invisible for about 70 days (at the geographical latitude of Memphis). On that day it appears a few degrees above the Eastern horizon and disappears again after about 15 minutes due to the brightening of the sky just before sunrise. The date of heliacal rising depends on the relative positions of Sirius and the Sun with respect to the horizon and on atmospheric conditions.

According to Parker in the ancient Egyptian lunar calendar an additional 13th month was intercalated in the next year whenever the first visibility of Sirius (associated with the Goddess Sothis) occurred during the last 11 days of the last month *Wep renpet* of the lunar year.[1] In this way the Egyptians could make sure that the first month *Toth* of their lunar calendar always began shortly (within one lunar month) after the first visibility of Sirius. The heliacal rising of Sirius plays a crucial role in Egyptian chronology because it is supposed to fix the zero-point of the Egyptian civil calendar of 365 days by postulating that at the time of its installation the first visibility of Sirius occurred on the first day of the first month.

One of the earliest references to the use of Sirius for intercalation in the Mesopotamian lunar calendar is found on Tablet II of MUL.APIN where we are told that if Sirius rises in the month Du'uzu (the 4th month) this year is normal but if it rises in the month Abu (the 5th) an extra month has to be intercalated that year.[2] On Tablet I the nominal date of the first visibility of Sirius in the lunar calendar is given

[1] R. A. Parker, "The Calendars and Chronology", in: *The Legacy of Egypt*, J. R. Harris, ed., (Oxford, 1971), 13–26; cf. also below, Chapter III. 10.

[2] H. Hunger & D. Pingree, *MUL.APIN: An Astronomical Compendium in Cuneiform*, *AfO* Beiheft 24 (1989).

as "the 15th of Du'uzu" (the 4th month) as part of a list of first visibility dates of about 30 stars. This list was based on observations carried out in Babylon during the 13th century BC.[3] Later (during the 5th to 1st centuries BC) dates of the first appearance of Sirius are given in the Astronomical Diaries.[4] Sachs has shown that in the Babylonian 19-year calendar cycle, introduced in the early 5th century BC and used without any further change during five centuries throughout the ancient near-East, the intercalation pattern was arranged in such a way that Sirius always rose in the 4th lunar month Du'uzu.[5]

Starting with Ptolemy (~130 AD) in his *Almagest* (Book VIII.6),[6] astronomers have discussed the heliacal rising (also referred to as first visibility or first appearance) of stars and planets in terms of the so-called *arcus visionis*, the distance between a star/planet and the sun, measured in degrees perpendicular to the horizon when it becomes visible again for the first time in the morning twilight sky. In the second book of his Φάσεις ἀπλανῶν ἀστέρων καὶ συναγωγὴ ἐπισημαισῶν. Ptolemy gives the dates of first and last visibility of some 30 bright stars at different geographical latitude zones (κλίματα) from which values of the *arcus visionis* can be deduced.[7] For Sirius Ptolemy apparently uses a value of about 11°.

In the 1920's Carl Schoch was the first to attempt to determine values of the *arcus visionis* for Sirius and for the planets from Babylonian observations.[8] He derived a value of 7.7° degrees for Sirius. The recent edition of the Astronomical Diaries by Sachs and Hunger allows a reanalysis of the Babylonian observational material. We now know that the number of genuine observations of the date of first visibility of Sirius in the Diaries is quite small since Sachs showed that almost all dates during the Seleucid Era (last three centuries BC) are computed

[3] T. de Jong, "A New Attempt to Date the Observations of Rising Stars in MUL.APIN", paper presented at the 7th Notre Dame Workshop on the History of Astronomy (July 2005).

[4] Sachs & Hunger, *Diaries*.

[5] A. Sachs, "Sirius Dates in Babylonian Astronomical Texts of the Seleucid Period", *JCS* 6 (1952), 105–114.

[6] See Toomer, *Almagest*.

[7] H. Vogt, "Griechische Kalender V. Der Kalender des Claudius Ptolemäus", *Sitzungsberichte der Heidelberger Akademie der Wissenschaften*, Phil.-Hist. Klasse, 15. Abh. (1920), 1–61

[8] C. Schoch, *The Arcus Visionis in the Babylonian Observations* (Oxford, 1924); idem, "The Arcus Visionis of the Planets in the Babylonian Observations", *Monthly Notices of the Royal Astronomical Society* 84 (1924), 731–734.

rather than observed.[9] This is probably the reason that Schoch's value is rather small, because the Babylonian computational scheme is apparently based on dates observed under optimal atmospheric conditions.

It turns out that there are only two genuinely observed dates of the first appearance of Sirius listed in the Diaries: day 18, month IV, year 12 of Darius III (22 July 325 BC) and day 13, month IV, SE 22 (20 July 290 BC). An analysis of these data results in *arcus visionis* values of 11.0° and 8.6°, respectively.

To determine the best value of the *arcus visionis* of Sirius for the purpose of calibrating the Egyptian civil calendar in studies of Egyptian chronology L. Borchardt and P. V. Neugebauer in 1926 organized an observing program of the first visibility of Sirius in Egypt. Results of this study are summarized and discussed in a recent paper by Pachner.[10] He shows that the 1926 program resulted in the determination of *arcus visionis* values for Sirius of 8.7°–9.2°.

The problem was discussed again by Schaefer without taking the results of Pachner into account.[11] He suggested a value of the *arcus visionis* for Sirius of about 11°, similar to the value derived by Vogt from Ptolemy's Phaseis. His analysis was based on a theoretical model of stellar visibility adopting a visual extinction for the atmosphere near ancient Memphis of 0.35 magnitudes per air mass (one air mass is a measure of the thickness of the atmosphere at zenith). This extinction estimate was based on data for Jerusalem. In his paper he also listed the expected dates of heliacal rising of Sirius between 3500 BC and 500 AD for his adopted value of the extinction.

To put things into perspective I have computed values of the *arcus visionis* and dates of the heliacal rising of Sirius in Egypt using the model of de Jong and Inklaar,[12] which is an improved and updated version of the earlier model of Inklaar.[13] In this model the visibility of stars and planets is computed based on the brightness of the twilight

[9] See n. 5.
[10] N. Pachner, "Zur Erfassung der Sichtbarkeitsperioden ekliptikferner Gestirne", *Ä&L* 8 (1998), 125–136.
[11] B. E. Schaefer, "The Heliacal Rise of Sirius and Ancient Egyptian Chronology", *JHA* (2000), 149–155.
[12] T. de Jong & F. Inklaar, "A New Method to Compute First and Last Visibilities of Stars and Planets" (2006), in preparation.
[13] F. Inklaar, *Een Nieuwe Methode voor de Berekening van Heliakische Opkomsten*, doctoraalscriptie, (Universiteit van Amsterdam, 1989).

sky as a function of the depression of the Sun below the horizon, on the transparency of the atmosphere and on the sensitivity of the human eye in twilight conditions. The physical principles underlying this model are similar to those adopted in the earlier models of Bruin[14] and of Schaefer[15] but some of the assumptions and parameters used are different.

Using this model I have computed the parameters in Table III. 9.1 characterizing the heliacal rising of Sirius in 1000 BC for a location at geographical latitude 30° North, representative for ancient Memphis along the Nile. Visual magnitude, position and proper motion of Sirius were taken from *The Bright Star Catalogue*[16] and precession was calculated according to algorithms in the *Explanatory Supplement to the Astronomical Almanac*.[17] Results are given for three different values of the visual atmospheric extinction k(V) in column (1) by averaging over 4 years around 1000 BC. Values of the apparent altitude of Sirius above the horizon when it first becomes visible are given in column (2) and of its true altitude (without atmospheric refraction) in column (3) as well as the true solar depression below the horizon in column (4). In column (5) I list the actual average *arcus visionis* <h>, the distance between Sun and Sirius perpendicular to the horizon at first visibility (column (4) subtracted from column (3)). In columns (6) and (7) I list the Julian date and the local time of the first visibility of Sirius and in column (8) the duration of its visibility. The averaging takes account of the fact that the ecliptic longitude of the Sun at sunrise on any Julian date varies from year to year and returns to the same value every four years (due to Julian intercalation). Notice that if one wants to compute the date of heliacal rising based on a value of the *arcus visionis* one should use a minimum value h_0 which is ~0.5° (one half the daily motion of the Sun) smaller than the average values listed in Table III. 9.1.

The day on which the heliacal rising of Sirius (Sothis) was observed in ancient Egypt clearly depends on the prevailing atmospheric conditions. In Table III. 9.2 I show values of the average visual extinction as measured at different locations on Earth at different epochs.

[14] F. Bruin, "The heliacal setting of the stars and planets" I & II, *Proceedings of the Koninklijke Nederlandse Akademie van Wetenschappen*, Series B, Vol. 82 (1979), 385–410.

[15] B. E. Schaefer, "Predicting Heliacal Risings and Settings", *Sky and Telescope* 70 (1985), 261–263; idem, "Heliacal Rise Phenomena", *Archeoastronomy* 11 (1987), S19–S33.

[16] D. Hoffleit, *The Bright Star Catalogue* (New Haven, 1982).

[17] P. K. Seidelmann, ed., *Explanatory Supplement to the Astronomical Almanac* (Mill Valley: University Science Books, 1992).

Table III. 9.1. Heliacal rising of Sirius at GB = 30° in 1000 BC

Visual extinction k(V)	Apparent stellar altitude	Real stellar altitude	Real solar altitude	Arcus visionis <h>	Julian date	Local Time	Duration of visibility
0.20	1,5	1,1	−6,9	8,0	16-jul	4:25	13
0.27	2,3	2,0	−7,3	9,3	17-jul	4:24	14
0.35	3,2	2,9	−7,7	10,7	19-jul	4:22	14
mag/airmass	degrees	degrees	degrees	degrees	dd-mon	hrs:min	minutes

Not surprisingly, the data show that by far the clearest skies (lowest extinction values) are found in dry regions at high altitudes where present-day astronomical observatories are located (McDonald Observatory on Mount Locke, Texas, USA[18] and the European Southern Observatory on La Silla, Chile).[19] According to the data in Table III. 9.2 much poorer atmospheric conditions are found in humid climates at sea level (Leiden Observatory, the Netherlands,[20] no longer in use) and at low altitudes (Jena Observatory in Grossschwabhausen, Germany).[21] It is instructive to realize that an increase in extinction of 0.1 magnitudes corresponds to a small decrease in the intensity of starlight of 10% at zenith but to a large decrease by a factor 4 at 3° above the horizon.

One important uncertainty that affects estimates of the atmospheric extinction is the aerosol content of the atmosphere, which over the last century and a half has been noticeably increasing due to industrial pollution. Therefore I also list in Table III. 9.2 values of the atmospheric visual extinction in Mesopotamia during the 6th and 7th century BC derived from an analysis of ancient observations of Saturn from Babylon and Uruk[22] and during the 13th century BC from an analysis of obser-

[18] R. J. Angione & G. de Vaucouleurs, "Twenty years of atmospheric extinction at McDonald observatory", *Publications of the Astronomical Society of the Pacific* 98 (1986), 1201–1207.

[19] F. Rufener, "The evolution of atmospheric extinction at La Silla", *Astronomy and Astrophysics* 165 (1986), 275–286.

[20] K. K. Kwee & A. M. van Genderen, "Photo-electric Observations of 31 and 32 Cygni during November and December 1961", *Bulletin of the Astronomical Institutes of the Netherlands* 17 (1963), 53–55.

[21] H.-G. Reimann, V. Ossenkopf & S. Beyersdorfer, "Atmospheric extinction and meteorological conditions: a long time photometric study", *Astronomy and Astrophysics* 265 (1992), 360–369.

[22] T. de Jong, "Early Babylonian Observations of Saturn: Astronomical Considerations", in: *Under One Sky*, J. M. Steele & A. Imhausen, eds., (Münster: AOAT 297, 2002), 175–192.

Table III. 9.2. Atmospheric visual extinction at different locations and epochs

Location	Epoch	Season	Altitude	<k(V)>
Babylon, Mesopotamia	~1300 BC	yearly average	sea level	0,27
Babylon, Mesopotamia	647–634 BC	jul–nov	sea level	0,25
Uruk, Mesopotamia	577–575 BC	oct–dec	sea level	0,34
Leiden, the Netherlands	1961	nov–dec	sea level	0,43
Grossschwabhausen, Germany	1968–1991	yearly average	350 m	0,36
Mount Locke, Texas, USA	1960–1980	yearly average	2000 m	0,17
La Silla, Chile	1975–1985	yearly average	2400 m	0,12

vations of about 20 bright stars from Babylon.[23] These values are close to the present-day visual extinction for clear skies at sea level of about 0.28 magnitudes per air mass (0.02 due to Ozone absorption, 0.12 due to molecular scattering and 0.14 due to aerosols and dust).[24] Contrary to Schaefer[25] who adopted 0.35 magnitudes per air mass for the Memphis area I suggest that 0.27 is a more appropriate choice since the climatic conditions in the Nile valley near Memphis are probably quite similar to those in the Euphrates valley near Babylon. This value is consistent with the 1926 observations summarized by Pachner[26] because *arcus visionis* values of 8.7°–9.2° correspond to a visual extinction of about 0.25 magnitudes per air mass (see Table III. 9.1). Ptolemy's *arcus visionis* of 11° (corresponding to a visual extinction of about 0.35 magnitudes per air mass) is appropriate for the much more humid conditions in Alexandria at the shore of the Mediterranean.

For chronological purposes the actual date of heliacal rising of Sirius is the crucial quantity. In Table III. 9.3 I list dates of heliacal rising of Sirius computed for geographical latitudes 25° North (Edfu) and 30° North (Memphis) for different values of the atmospheric visual extinction at different epochs in antiquity. These dates are averages over four consecutive years. As argued above atmospheric conditions in arid upper Egypt (Elephantine and Memphis) are probably best characterized by a visual extinction k(V) = 0.27 magnitudes per air mass, while for the more humid climate of lower Egypt (Alexandria) k(V) = 0.35 magnitudes per air mass may be more appropriate.

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[23] See n. 3.
[24] See M. S. Bessell, "UBVRI passbands", *Publications of the Astronomical Society of the Pacific* 102 (1990), 1181–1199.
[25] See n. 11.
[26] See n. 10.

Table III. 9.3. Julian dates of the heliacal rising of Sirius and of summer solstice

k(V)	0.20	0.27	0.35	0.20	0.27	0.35	Summer
Epoch	Geographical Latitude = 25°			Geographical Latitude = 30°			Solstice
3500 BC	8-jul	10-jul	11-jul	14-jul	16-jul	17-jul	22-jul
3000 BC	8-jul	10-jul	11-jul	14-jul	16-jul	17-jul	18-jul
2500 BC	9-jul	11-jul	12-jul	14-jul	16-jul	18-jul	14-jul
2000 BC	9-jul	11-jul	12-jul	15-jul	17-jul	18-jul	10-jul
1500 BC	10-jul	12-jul	13-jul	15-jul	17-jul	18-jul	7-jul
1000 BC	11-jul	12-jul	14-jul	16-jul	17-jul	19-jul	3-jul
500 BC	11-jul	13-jul	14-jul	16-jul	18-jul	19-jul	29-jul
1 AD	12-jul	14-jul	15-jul	17-jul	18-jul	20-jul	25-jun
500 AD	13-jul	14-jul	15-jul	17-jul	19-jul	20-jul	21-jun

The atmospheric extinction varies due to changing weather conditions. On some dates this will make Sirius unobservable and it may cause variations in the date of heliacal rising of Sirius of up to about ± 3 days, corresponding to extreme values of k(V) ranging from 0.15 to 0.40 magnitudes per air mass.[27]

The data in Table III. 9.3 also show that in the course of 4000 years the date of the heliacal rising of Sirius moves forward with respect to the summer solstice by one day in about 120 years. This is due to precession but tempered by the fact that Sirius lies far (~40°) south of the ecliptic. For a star in the ecliptic this forward motion would be one day in about 75 years, as expected for a rate of precession of 1° in 72 years. The rather large proper motion of Sirius, which causes a displacement in the sky of about 1.5° in 4000 years, only causes a minor shift in the date of heliacal rising of about one day over that period. Notice that the inaccuracy of the Julian calendar causes the summer solstice to recede by about one month in 4000 years rather than two months as expected for an accurate solar (Gregorian) calendar.

Acknowledgements

I am grateful to Rolf Krauss and Peter Huber for several useful comments and suggestions for improvement.

[27] See n. 22.

III. 10 EGYPTIAN SIRIUS/SOTHIC DATES, AND THE QUESTION OF THE SOTHIS-BASED LUNAR CALENDAR

Rolf Krauss

In addition to the observational conditions discussed by T. de Jong in the preceding chapter, there are three factors which must be considered when dealing with Egyptian Sirius (Sothic) dates: 1) the quadrennium; 2) geographical reference; 3) regular observation versus schematic determination.

Quadrennium

Under the same meteorological conditions and at the same site, the heliacal risings of Sirius occur as a rule thrice at intervals of 365 days, followed by the fourth rising after 366 days. On each of the these consecutive risings the ecliptic longitude of the sun and thus also the distance between sun and Sirius would have decreased, so that in the fourth year the distance would have been too small for sighting the star after 365 days. Only on the 366th day after the last sighting would the star have been observable.

Because the Egyptian calendar year was only 365 days long, it fell one day behind the heliacal rising of Sothis every four years when the rising occurred after 366 days. Accordingly, a specific date in the Egyptian year correlates to the heliacal risings of 4 consecutive years. Because Egyptian sources do not specify in which year of a quadrennium a given recorded Sothic date fell, there are usually four years in the Julian calendar that might correlate with it. A specific year can be determined only when additional data are available, such as the lunar date associated with the Sothic date, in the Illahun archive.

Geographic Reference and Its Interplay with Astronomically or Schematically Determined Sothic Dates

Regardless of where the Egyptians observed the rising of Sothis, the date could not apply elsewhere, because Egypt's ancient boundaries extended from 24° (First Cataract, Elephantine) to 31.15° (Diospolis inferior) north latitude. In the 28th century BC, when the Sothic-linked 365 day calendar will have been introduced, the date when the star rose differed by more than one day for each degree of latitude, so that the star rose 8 to 10 days later on the Mediterranean coast than at Egypt's southern border. Sighting was effected not only by latitude, but also by the meteorological differences between Upper and Lower Egypt: UE is dry and arid, LE is more humid which results in a higher extinction.

The impracticability of using several different calendars in each zone evidently led the inventors of the Egyptian calendar to choose one particular site as the geographical reference for the calendrical heliacal risings of Sothis. A single source provides information on the geographical reference: in the 6th century AD Olympiodoros, in his commentary on Aristotle's *Meteora*, remarked that the rising of Sothis was celebrated in Alexandria when the star rose for the Memphites.[1] Until about 1950, Egyptologists assumed that Memphis was the reference point for all Sothic dates throughout Egyptian history.[2] Presuming schematically determined rising dates, Eduard Meyer, for example, calculated III Shemu 9 of 9 Amenhotep I, the Sothic date in Papyrus Ebers, as corresponding to the quadrennium 1550/49 to 1547/46 BC; by adding 8 years of Amenhotep I and 26 years of Ahmose he arrived at ca. 1580 BC for the beginning of the NK.

Later Egyptologists abandoned the concept of schematic Sothis risings, but retained Memphis as the reference point for Sothic dates of all periods. Using an *arcus visionis* of 9° the rising of Sothis occurred at Memphis around 1500 BC on July 17/16; the Ebers Sothic date corresponds to these days in 1538–1535 BC.[3] It follows that the beginning of the NK would have been ca. 1570 BC.

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[1] Sethe, "Zeitrechnung", 309.

[2] Hornung, *Untersuchungen*, 20.

[3] III Shemu 9 corresponds to July 17 from 1541 to 1538 BC and to July 16 from 1537 to 1534 BC.

Around 1950 new sources relating to the Assyrian-Babylonian kinglists came to light which shortened Near Eastern and Egyptian chronology by about 20 years. Shifting the geographical reference point for the Ebers Sothic date from Memphis (φ = 29.9°) to Thebes (φ = 25.7°), compensated for the 20-year chronological difference, provided that the rising of Sothis mentioned in Papyrus Ebers had actually been observed.

In the 1970s it became clear that the relative and the absolute chronology of the NK had to be shortened further by at least 10 years, yielding ca. 1540 BC for the beginning of the NK.[4] The only possibility to reconcile this chronology with the Ebers Sothic date was to propose a geographical reference point further south, namely on the island of Elephantine (φ = 24°). Within Egypt's traditional borders, the rising of Sothis could be seen earliest at Elephantine, the southernmost point. Here lay the mythical source of the Nile. Late Period texts associate the rising of Sothis with the beginning of the inundation at Elephantine. Measurement of the height of the inundation at Elephantine (as at Memphis) was particularly important for the entire country.[5]

Because of precession, the heliacal risings of all fixed stars shift within the tropical year. For Sirius, the large proper motion modifies the effect of precession. Around 2750 BC Sirius will have risen at latitude 24° on June 16th Greg., but today it rises there on July 29th Greg. In pharaonic times the Sothic year was always longer than the Julian year by about one minute. When, over centuries, the difference added up to a quarter of a day, the rising of Sothis fell for only three, rather than for four, years on the same Egyptian calendar day and the shift to the next day occurred in the third year, not the fourth. If the annual observation of the rising of Sothis was a feature of the Egyptian calendar, then the occasional shift of the rising should have been accounted for in triennia. By contrast, it is possible that the calendar dates of the rising depended upon a series of observations made during the period before the introduction of the calendar with Sothic dates thereafter schematically shifted one day every four years. Only an evaluation of the Egyptian historical sources—not astronomical or calendrical theorizing—can determine which alternative is correct.

Hieroglyphic sources preserve two relevant statements. (1) The rising of Sothis in 7 Senwosret III was not actually observed, instead it

[4] Bierbrier, *Kingdom*, 109ff.
[5] Krauss, *Sothis*, 63–67.

was announced 22 days in advance and might have been 'known' earlier. (2) The Canopic Decree of Ptolemy III Euergetes of March 7 in 238 BC asserts that the rising of Sothis shifts forward one day every four years.[6] The purpose of the decree was to introduce a sixth epagomenal day every four years,[7] so that the rising of Sothis continued to fall on Payni 1 (II Shemu 1), as it had in the year before the decree (239 BC).[8] No mention is made of a possible shift after three years.

According to Clagett there is a third hieroglyphic source. He understands an inscription of Ptolemy IV to contain an assertion about the regular shift of the rising of Sothis in intervals of four years.[9]

Other statements with a bearing on the question are to be found in Latin and Greek sources. In "De die natali" (18, 10), the orator Censorinus commented on Great Years:

> The Great Year of the Egyptians has nothing to do with the moon. In Greek we call it Dog's Year, in Latin canicularis, because it begins on the 1st day of the month Thoth, when the Dog star rises. For the civil calendar of the Egyptians, the year numbers 365 days without any intercalation. So it is that a period of 4 years is about one day shorter than the natural quadrennium. And it follows that New Year's Day coincides in both systems only after 1461 [Julian] years. Some call this Great Year a Helios year; others, God's Year.

Censorinus also noted (c. 21, 10–11) that in the year when he was writing, namely AD 238, the "Egyptian New Year's day fell on June 25th. But a hundred years earlier, during the second consulate of Emperor Antoninus Pius and Bruttius Praeses, the Egyptian New Year's Day fell on the *20th of July, the day when the Dog star rose."[10] Thus on the 20th of July in AD 139 a new period of 1460 Egyptian years had started.[11] Borchardt claimed that coins minted at Alexandria in year 2 of Antoninus Pius showing a haloed phoenix and the legend AIΩN commemorated the Sothic period.[12] Even though AIΩN may be a Hellenistic deity that was identified in Alexandria with Osiris embod-

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[6] Clagett, *Science* II, 326–331.
[7] Presumably at the end of a quadrennium, the first time in 235 BC.
[8] For details Krauss, *Sothis*, 54–57, and Spalinger, *Studies*, 39–50.
[9] Clagett, *Science* II, 331–333.
[10] C. Rapisarda, *De die natali liber ad Q. Caerellium* (Bologna: ESUFC 47, 1991), 44–45.—Censorinus writes "21st of July"; cf. Meyer, *Chronologie*, 24, and Rapisarda, ibidem, 258–259cf.
[11] Borchardt, *Annalen*, 55–56; idem, *Mittel*, 11; cf. Hornung, *Untersuchungen*, 17.
[12] Borchardt, *Annalen*, 55–56.

ied in his turn as Phoenix,[13] Borchardt might have been right nevertheless, since Tacitus, *Annals* VI. 28, refers to one opinion that the Phoenix lived for 1461 [Egyptian years = 1460 Julian years] and was thus associated with the Sothic period.[14]

About AD 400 Chalcidius, in his commentary on Plato's Timaeus, called Sothis the Egyptian equivalent of Sirius and stated, like Censorinus, that the length of a Sothic cycle was 1460 years.[15]

According to Theon of Alexandria (ca. 335–405 AD),[16] the day of Sothis's rising would have shifted by 426 days from Thoth 1 in year 1 of the era *απο Μενοφρεως* until year 100 of the era of Diocletian (384 AD), had the fixed Alexandrian year not been introduced.[17] Because of this calendar reform, there were only 324 shifts before the 100th year of the Diocletian era.[18] Thus the era "apo Menophreos"[19] would have begun, in our terms, in 1322 BC and would have ended in AD 138/139, as implied by Censorinus, i.e. for Theon the Sothic cycle lasted full 1460 years.

Clearly Graeco-Roman sources reckoned with a regular shift of the rising of Sothis in quadrennia; the later 19th century astronomer Oppolzer asserted that during the Graeco-Roman period it was unknown that the Sothic year varied in length.[20] Accordingly, Egyptologists traditionally assumed that the calendric rising of Sothis was shifted regularly and schematically every four years, implying exactly 365.25 days as the length of a Sothic year. Oppolzer computed the length of the Sothic year as being longer than the Julian year during the pharaonic period. For him the question of whether the historical Sothis-bound calendar relied on annual observation, resulting in triennia, or on a

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[13] G. W. Bowersock, *Hellenism in Late Antiquity* (Ann Arbor, 1990), 24–26.

[14] Krauss, *Sothis*, 200.

[15] Meyer, *Chronologie*, 30 Anm. 1.

[16] Or perhaps a commentary on his works, cf. L. Depuydt, *JARCE* 32 (1995), 46–47.

[17] C. R. Lepsius, *Königsbuch der alten Aegypter* (Berlin, 1858), 123–124; Meyer, *Chronologie*, 29 n. 1.

[18] Other details of Theon's computation remain unclear, see Meyer, *Chronologie*, 28–29.

[19] Menophris is neither a garbled royal name nor a rendering of "Memphis" (Egyptian: *Menfe*), but rather the name of a solar god attested in the Hellenistic period, cf. Krauss, *Ende der Amarnazeit* (1978), 268–273. Like Censorinus, Theon implied the solar nature of the Sothic cycle when he spoke of it as the "era of (the solar god) Menophris".

[20] Th.v. Oppolzer, "Über die Länge des Siriusjahres und der Sothisperiode", Sitzungsberichte der mathematisch-naturwissenschaftlichen Classe der Kaiserlichen Akademie der Wissenschaften, XC. Band, II. Abtheilung, Jahrgang 1884 (Vienna, 1885), 576; Ginzel, *Handbuch* I, 191.

cyclic scheme of regular quadrennia remained undecided, although he showed a bias for yearly observation.[21]

In 1904 Förster computed the length of the Sothic year at Meyer's request. Förster arrived at a smaller difference between the Sothic and the Julian year than Oppolzer.[22] He calculated the rising of Sothis at Memphis on July 19 (Jul.) throughout pharaonic history. Later Schoch[23] and Neugebauer[24] corrected Förster's figures; they found a difference between the Sothic and Julian years that caused shifts of the rising day in triennia. The most recent calculation of the length of the Sothic year confirmed their result.[25] Neugebauer concluded that the recorded rising dates of Sothis cannot have been schematically determined, but must have depended on observation. The assumption that the rising dates were determined schematically results in the following paradox: if the rising of Sothis be reckoned backwards schematically from the Censorinus and Canopus dates, then the starting date for the 1460-year cycles is astronomically incorrect by several days. If, however, an astronomically correct date is calculated for the beginning of the historical cycles, then the Canopus and Censorinus dates do not match.

The paradox can be resolved by supposing that the Sothis-bound 365 day calendar was schematical from its introduction, in the 28th century BC, with reference to a site in UE. The shift of the reference point to Memphis that Egyptologists recognized around 1950 may have taken place as late as Dyn. 30, i.e. in the 4th century BC. If a schematic calendar had been used since its introduction down to the 4th century BC, then the risings of Sothis that were observable at the geographic reference point occurred 4 days later than those determined schematically. Presuming the discrepancy were to be overcome in the 4th century BC, two workable possibilities offered themselves: a) either the schematic date of the rising was corrected by the addition of 4 days without altering the geographic reference, b) or the geographic reference point was moved from UE to a northern site.

Evidently Memphis was chosen as the new reference point. The calendar day of the rising of Sothis at Memphis was determined by obser-

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[21] Oppolzer (n. 20), 584.

[22] Meyer, *Chronologie*, 14–15.

[23] C. Schoch, *Die Länge der Sothisperioden beträgt 1456 Jahre* (Steglitz, 1928; Reprint: Kiel: Astronomische Nachrichten 8, 2; 1930).

[24] P. V. Neugebauer, *Astronomische Nachrichten* No. 6261 (Kiel, 1937), 377–378.

[25] M. F. Ingham, *JEA* 55 (1969), 36–40.

vation and served as the initial day of a new schematically determined series, i.e. the calendar remained schematical. With the Gregorian reform, days had to be eliminated to achieve its goal, whereas there would have been no need to do so when reforming the Sothic calendar. In 400/399 BC the shift would have caused the rising day to leap 10 days from IV Peret 10 to 20. In other words, the cycle would not have started in 1322 BC, i.e. 1460 years before 138/139 AD, but 10 × 4 years = 40 years later. A calendar that was based on regular observation of Sothis would not have required a shift of its geographical point of reference; thus the shift that Egyptologists recognized around 1950 implies a schematic calendar.

Comments on Peret Sepdet Dates

I Peret 4–19	Festival calendar of Amenhotep I[26]
[?	Raʿneferef archive]
II Peret 21	coffin of Ashayt (T3C)
III Peret 30	coffin S3P
IV Peret 21	coffin S11C
IV Peret	Festival calendar of Amenhotep I[26]
IV Peret 16	Abydos, Osireion[27]
IV Peret 16 or *18	year 7 [Senwosret III]
IV Peret	year 1 [Amenemhet III]
IV Peret	[Amenemhet III]
<II Shemu 20	year **11, Luxor—Farshut road>[28]
III Shemu 9	year 9 of Amenhotep I
III Shemu 28	Festival calendar of Elephantine, Thutmose III[29]

(continued on next page)

[26] The festival calendars of Amenhotep I cite festival calendars of much earlier periods without indicating the names of the contemporaneous kings, cf. Spalinger, *Studies*, 15–17; idem, "Sothis and 'Official' Calendar Texts", *VA* 10 (1995), 175–181, esp. 179.

[27] Clagett, *Science* II, 357–392, at 357; 380.

[28] J. C. Darnell, *Theban Desert Road Survey in the Egyptian Western Desert* I. (Chicago: OIP 119, 2002).—At the SCIEM Workshop "Egypt & Time" (Vienna June 30 to July 2, 2005), K. Ryholt argued (a) that the year ought to be read 31, and (b) that the graffito does not mention Sothis at all.

[29] The inscription (*Urk*. IV 827,8) belongs to a list of festivals which is dated epigraphically to the end of reign of Thutmose III, cf. Krauss, *Ä&L* 3 (1994), 90–92.—The translation of *prt spdt mꜣʿ.tw* as "true rising of Sothis", in: E. Blumenthal, I. Müller & W. F. Reineke, eds., *Urkunden der 18. Dynastie*. Übersetzung zu den Heften 5–16 (Berlin, 1984), 271 is incorrect; read, rather, "Rising of Sothis, one offers".

Table (*cont.*)

–	Festival calendar of Buto, Thutmose III[30]
I Akhet	Festival calendar of Medinet Habu, Ramesses III[31]
[Thoth 1, 1322 BC	era απο Μενοφρεως], see above
II Shemu 1, 239 BC	Canopus decree, see above
Thoth 1, 139 BC	Censorinus date, see above

Peret Sepdet in the Raʿneferef Archive?

The archive functioned at least until the last years of Izezi. It mentions the moveable *wꜣgj* feast that is also attested in the Illahun archive[32] where it was celebrated on LD 17, apparently in the second lunar month after the rising of Sothis.[33] However, the moveable *wꜣgj* feast may have been a seasonal event, perhaps related to the availability of new wine.[34] If so, it might have been celebrated on a LD 17 when new wine was available, whether the month happened to be the third or second after the rising of Sothis. Regardless, Luft suggests that the *wꜣgj* date III [Akhet] 28 in the Raʿneferef archive corresponded to LD 18 (sic) in the first lunar month after the rising of Sothis,[35] resulting in a date around ca. 2450 BC which is far too early for the archive, according to any recent Egyptological chronology.[36] If the *wꜣgj* date III [Akhet] 28 referred to the second lunar month after the rising of Sothis, corresponding to the time when it was celebrated at Illahun, then a date around 2600 BC would result. If the date is emended to III [Peret] 28,[37] then it would have occurred in the third lunar month after the rising of Sothis, provided Izezi's reign lay in the second half of the

[30] Bedier, Shafia, in: Aspekte spätägyptischer Kultur. Fs Erich Winter (Mainz: Aegyptiaca Treverensia 7, 1994), 35–50.—The rising of Sothis is noted between festivals of the first month of Shemu, but neither month nor day is specified.

[31] *MHC 629*: "I Akhet, when Sothis goes forth on her day", and thus on any day in I Akhet from 1 to 30, cf. Parker, *Calendars*, 40.

[32] P. Posener-Kriéger, "Remarques préliminaires sur les nouveaux papyrus d'Abousir", in: *Ägypten: Dauer und Wandel* (Mainz: DAIS 18, 1985), 35–43.

[33] Krauss, *Sothis*, 86–94; for LD 17 (not LD 18) see Krauss, in: Bietak, *SCIEM Haindorf* 2001, 192, with additional literature.

[34] P. Posener-Kriéger, "Wag-fest", in: *LÄ* VI, 1135–1139; R. Krauss, *GM* 162 (1998), 57–58.

[35] U. Luft, "The Date of the *wꜣgy* Feast: Comments on the Chronology of the Old Kingdom", in: Spalinger, ed., *Revolutions*, 39–44.

[36] Krauss (n. 34), 53–57; cf. above Verner, Chapter II. 4.

[37] L. Depuydt, *JARCE* 37 (2000), 167–186, at 173.

24th century BC. Thus it seems impossible to deduce a chronological result without circular reasoning.

Heliacal Rising Dates of Sothis in the Star Clocks

To date, there are 19 complete and/or fragmentary known coffin lids decorated with so-called diagonal star clocks or diagrams of certain rising stars, conventionally called decans.[38] The diagrams indicate risings at 12 intervals ("hours") during the night, and at 10-day intervals ("decades") during the Egyptian year.[39] A star that rises in the 12th hour of the night, i.e. at dawn, on the first day of a decade, rises heliacally. According to Neugebauer and Parker the diagonal star clocks are roughly datable by the position of Sirius/Sothis as 12th hour star.[40] They reckoned a margin of ca. 50 years, considering that the extant star clocks are copies from older ones; their grouping of the extant star clocks has been superseded by the analysis of J. Kahl.[41]

The star clocks preserve dates for the rising of Sothis between II Peret 21 and IV Peret 21, corresponding to an interval of 240 years from roughly 2060 to 1820 BC. The only coffin with a star clock that is datable to a specific reign is T3C, the coffin of Ashayt, from the reign of Nebhepetreʿ Mentuhotep II.[42] T3C is at least once removed from the *Vorlage*.[43] In T3C, and in its *Vorlage*, the heliacal rising of Sothis is dated to II Peret 21. In relation to the Illahun Sothic date and supposing the same geographic point of reference, II Peret 21 corresponds to the early years of Inyotef II, whereas Ashayt lived and died more than 50 to 75 years later.

[38] K. Locher, "Middle Kingdom astronomical coffin lids: extension of the corpus from 12 to 17 specimens", in: Eyre, *Proceedings*, 697–701. For lids 18–19 see S. Symons, *JHA* 33 (2002), 257–260.
[39] For the decades see Gardiner, *Grammar*, Excursus C.
[40] Neugebauer & Parker, *EAT* I 29–32; 106.
[41] J. Kahl, "Textkritische Bemerkungen zu den Diagonalsternuhren des Mittleren Reiches" *SAK* 20 (1993), 95–107.
[42] In 2060 BC: II Peret 21 = July 9 (Jul.).
[43] Locher (n. 38), 608, Fig. 1.

Sothic Dates of Senwosret III and Amenemhet III

Bot instances of *Peret Sepdet* in IV Peret in the Illahun archive—but without specification of the day—are datable to Amenemhet III.[44] The rising of Sothis on the specific day IV Peret 16 in 7 Senwosret III was announced in a letter dated to III Peret 25, i.e. 22 days before the event.[45] A fragment of the temple diary, pBerlin 10012 A, contains a copy of the letter. The rising date IV Peret 16 is ambiguous. Another fragment of the temple diary states that the offerings for the Sothic festival in year 7 [of Senwosret III] were received, or entered in the temple diary, on IV Peret 17.[46] As a rule, offerings were delivered to Illahun one day or even two days before a festival.[47] On the basis of the delivery date alone, one would conclude that the rising of Sothis took place on IV Peret 18. Luft has pointed out grammatical and syntactical errors which were made, presumably, by the scribe when he copied the letter with the announcement.[48] It is possible that the scribe also made a mistake when he copied the date, writing IV Peret 16 instead of IV Peret *18.[49]

Supposing that the Illahun Sothic date refers geographically to Illahun, Brix computed the years 1876–1872 BC as corresponding to IV Peret 16 for the rising day in year 7 of Senwosret III.[50] Later Edgerton computed 1870 BC ± 6 years, by allowing a range of the arcus visionis from 9.5° to 8.4° and the possibility that the observations might have been made somewhere between Illahun and Heliopolis.[51]

Parker tried to accommodate the Illahun lunar dates to Edgerton's interval for the Sothic date and arrived at year 7 Senwosret III = 1872 BC.[52] His sequencing of the Illahun lunar dates was wrong, and consequently 7 Senwosret III = 1872 BC was also wrong;[53] for the same

44 Luft, *Fixierung*, 44–47; 123.
45 Luft, *Fixierung*, 54–58.
46 Luft, *Fixierung*, 57–58.
47 Krauss, *Sothis*, 79. For an apparent exception see Krauss (n. 33; *SCIEM*), 186 n. 76.
48 Luft, *Fixierung*, 55–57.
49 If the Sothis-bound lunar year of pBerlin 10056 is projected to later periods, only *peret Sepdet* on IV Peret *18 yields the calendric situation in year 9 of Amenhotep I as represented in the Ebers calendar; cf. below, end of section.
50 W. Brix, "Über das im zweiten Papyrusfund von Kahun enthaltene Sothisdatum des mittleren Reiches der ägyptischen Geschichte," *ZÄS* 41 (1904), 26–33; cf. also *ZÄS* 37 (1899), 101.
51 W. F. Edgerton, "Chronology of the Twelfth Dynasty", *JNES* 1 (1942), 307–314.
52 Parker, *Calendars*, 63–69.
53 Krauss, *Sothis*, 73–101; cf. Clagett, *Science* II, 323.

reason Barta's computation of 7 Senwosret III = 1875 BC was wrong.[54] On the basis of the correct sequencing of the Illahun lunar dates, the next possible, but not necessarily astronomically correct equation for 7 Senwosret III *before* 1872 BC would be 1880 BC, or *after* 1855 BC.

Luft postulated that the Illahun Sothic date refers to Memphis where Sothis rose in the 19th century BC on July 17 (Jul.).[55] As Table III. 10.1 shows, IV Peret 16 would have corresponded to July 16/17 (Jul.) during the quadrennium 1869 to 1866 BC, if the Egyptian calendar day began at sunrise as Luft erroneously supposes. Given that the calendar day began at dawn, IV Peret 16 actually corresponded to July 16/17 during the quadrennium 1873 to 1870 BC.

Table III. 10.1 also shows that III Peret 9, a day that is recorded in the Illahun archive as a lunar day 1 in year 9 of Senwosret III, corresponded to a lunar day 1 in 1864 BC, provided the calendar day began at dawn. Luft concluded that 7 Senwosret III, the year of the Sothic date, corresponded to 1866 BC, combining the lunar event in 1864 and the stellar event in 1866 BC. It is clear, however, that the rising of Sothis and the rising of old crescent were observed (or the absence of old crescent confirmed) during the same hour before sunrise. It contradicts simple logic and common sense to date the stellar and the lunar events to different Julian calendar days. Thus Luft's astronomical dating of the MK is patently wrong.[56]

Table III. 10.1

year BC	III Peret 9 (dawn)	IV Peret 16 (sunrise)	IV Peret 16 (dawn)
1873	LD 24	July 17/18	July 16/17
1872	6		
1871	16		
1870	27		
1869	8	July 16/17	July 15/16
1868	18		
1867	28		
1866	9		
1865	20	July 15/16	July 14/15
1864	1		

[54] W. Barta, "Die ägyptischen Sothisdaten und ihre Bezugsorte", *JEOL* 26 (1979–80), 26–34.

[55] Luft, *Fixierung*, 224–229.

[56] Furthermore, the proportion of 6 correct and 15 delayed lunar dates that Luft's date implies, cannot be the result of observation; cf. above Table III. 8.3.

When both possible dates (IV Peret 16 and *18) for the rising of Sothis in 7 Senwosret III are taken into consideration, together with the uncertainties of pharaonic Sothic dates, then the Illahun Sothic date corresponds to any year between ca. 1882 and 1830 BC.[57] As shown in Chapter III. 8 it follows from the astronomically correct computation of the Illahun lunar dates that 1 Senwosret III = 1837/36 BC and thus year 7 of Senwosret III = 1831/30 BC.

Sothic Date of the Ebers Calendar

The so-called Ebers calendar (see Fig. III. 10.1) is written on the recto of the medical papyrus Ebers. According to Möller the hand that wrote the calendar is palaeographically a few years younger than the hand of the medical text.[58]

For ease of orientation, the columns and lines have been numbered. According to line 1 the calendar refers to regnal year 9 of King Amenhotep I. If the regnal year and the period covered by the calendar were exactly concurrent, then the accession day of Amenhotep I coincided also with III Shemu 9. Whether Col. I lists months or feasts is contested (see below). Col. II contains civil dates, each 30 days apart, disregarding the epagomenal days after a well-attested fashion.[59] In Col. III the entry *peret Sepdet* (rising of Sothis) follows the calendar day III Shemu 9 and refers therefore to that day and only indirectly to *wep-renpet* of col. I, i.e. the text asserts directly that *peret Sepdet* occurred on III Shemu 9. The Ebers calendar has been studied and commented on by many authors, those since 1980 are Helck,[60] Luft,[61] Barta,[62] Krauss,[63] Leitz,[64] Beckerath,[65] Depuydt,[66] Spalinger[67] and Belmonte.[68]

[57] The upper limit is ca. 1882 BC, if the rising date is IV Peret 16 and Diospolis inferior is the observation site, where an arcus visionis ≥ 9° is to be expected, because of the high humidity near the Mediterranian coast.—The quadrennium 1833/30 BC is the lower limit, if Elephantine is the geographical point of reference and if the rising date IV Peret *18 was determined schematically with the arcus visionis ≥ 8.6°.

[58] G. Möller, *Hieratische Paläographie* I (Leipzig, 1909), 20.

[59] Cf. above, Chapter I. 5.

[60] W. Helck, *GM* 67 (1983), 47–49.

[61] U. Luft, *GM* 62 (1986), 69–71.

[62] W. Barta, *SAK* 8 (1980), 43–47.

[63] R. Krauss, *Ä&L* 3 (1992), 75–85.

[64] Leitz, *Studien*, 24–34.

[65] J.v. Beckerath, *SAK* 14 (1987), 28–31.

[66] L. Depuydt, "The Function of the Ebers Calendar", *Orientalia* 65 (1996), 61–88.

[67] A. J. Spalinger, "Notes on the ancient Egyptian Calendars", *Orientalia* 64 (1995), 17–32.

[68] Belmonte, "Questions", 50–55.

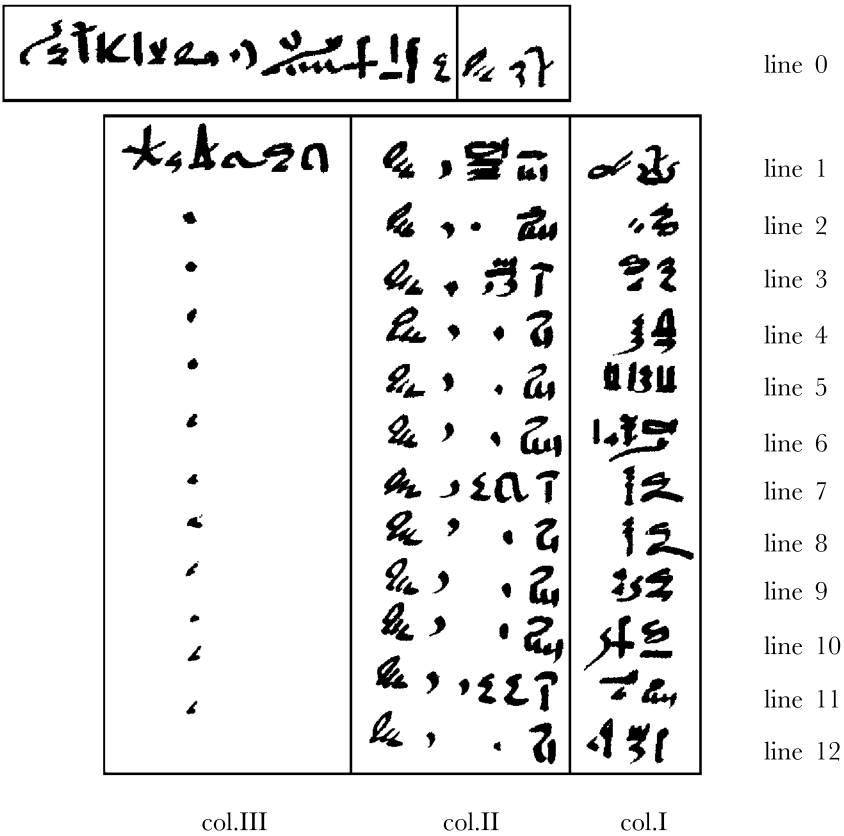


Fig. III. 10.1

If around 1500 BC the rising of Sothis was observable at the southern border of Egypt on July 10 (or 11) and at Diospolis inferior on July 19 (Jul.), then the rising on III Shemu 9 in 9 Amenhotep I referred to any of the years between ca. 1549 BC (July 19/18; Diospolis inferior) and ca. 1517 (July 10/11; Elephantine). If the rising dates were schematically determined, then III Shemu 9 in 9 Amenhotep I referred to any of the years from ca. 1541 BC (July 17; Diospolis inferior) to 1509/1506 BC (July 9; Elephantine). Thus the Ebers Sothic date cannot be earlier than ca. 1549 BC and not later than 1506 BC. Recently Kitchen argued on the basis of historical reasoning that Amenhotep I reigned from 1515 to 1494 BC,[69] implying that year 9 corresponded

[69] K. A. Kitchen, *Acta Archeologica* 67 (1996), 12.

to 1507/06 BC. If so, the Ebers Sothic date must be understood as schematically determined with geographical reference to Egypt's southern border.

Provided that there was no calendar reform between the Illahun and Ebers Sothic dates,[70] the relative distance between allows chronological conclusions. 333±3 years (Illahun Sothic date = IV peret 16) at most and 325±3 years (Illahun Sothic date = IV peret *18) at least elapsed between the two Sothic dates, dependent on the position of each within its quadrennium.[71] If these maximum and minimum figures are added to Kitchen's date for 9 Amenhotep I, then the Illahun Sothic date fell at the earliest in 1840/39 BC ± 3 and at the latest in 1831/30 BC ± 3. It is methodologically preferable to presume the same calendrical and geographical conditions for the Illahun Sothic date as for the Ebers Sothic date. If so, the Illahun Sothic date corresponds to 1830 BC and was schematically determined with the southern border as geographical reference. Alternatively, the Illahun Sothic date could correspond to 1840/39 BC. If so, it would have been determined by actual observation between the latitudes of Coptos and Asyut.

The Problem of the Sothis-based Lunar Calendar

From data in the Illahun archive and in the Ebers calendar Borchardt deduced the existence of a Sothis-based lunar calendar.[72] Parker concurred in principle although he corrected some of Borchardt's ideas.[73] Spalinger, who recently criticized lunar calendrics in general, nevertheless accepts the Sothis-based lunar calendar[74] although he points to the fact that Egyptological calendrics would be simpler without it.[75] In

[70] I.e. the geographical point of reference and the determination of the rising dates remained the same.

[71] These figures may be subtracted from 7 Senwosret III = 1830 BC, as determined by the Illahun lunar dates (see Chapter III. 8). The subtraction yields 1508 to 1494 BC for the Ebers Sothic date. The interval overlaps from 1508 to 1506 BC with 1549 to 1509/06 BC, the period of the Ebers Sothic date (see above). It follows that the astronomically correct interval for the Ebers Sothic date lies between 1508 and 1506 BC, harmonizing well with Kitchen's 1507/06 BC for year 9 of Amenhotep I.

[72] Borchardt, *Mittel*, 5ff.

[73] Parker, *Calendars*, 30ff.

[74] A. J. Spalinger, "Thot and the Calendars", 47–48, in: Spalinger, ed., *Revolutions*.

[75] A. J. Spalinger, "Months representations", *CdE* 70 (1995), 110–122.

general a Sothis-based lunar year represents a luni-stellar year, which is documented in other cultures.[76]

The Illahun papyrus Berlin 10056 contains a complete account and two fragmentary ones, each spanning a lunar year.[77] The complete account is headed: "Account of earth almonds and honey over the course(?) of a year. List over the course (?) of six months of the temple scribe Hornakhte. Regnal year 31. Offerings from this list."[78] After the heading, 6 intervals follow:

II Shemu 26 *nfrjjt-r* [to] III Shemu 25
IV Shemu 25 *nfrjjt-r* regnal year 31, I Akhet 19
regnal year 31, II Akhet 20 *nfrjjt-r* III Akhet 19
IV Akhet 19 *nfrjjt-r* I Peret 18
II Peret 18 *nfrjjt-r* III Peret 17
IV Peret 17 *nfrjjt-r* I Shemu 16

Each interval is designated as month (*ꜣbd*) of a phyle leader. It was evident to Borchardt that the six alternate months are lunar and represent either months 1, 3, 5, 7, 9 and 11 or months 2, 4, 6, 8, 10 and 12 of a lunar year of 354 or 355 days. He further realized that the rising of Sothis is the likely starting point for this lunar year.[79] Parker agreed in principle, but he ascribed pBerlin 10056 to Amenemhet III, and not to Senwosret III as Borchardt had done.[80] Reckoning 36 years of rule for Senwosret III, Parker placed *peret Sepdet* of years 30/31 of Amenemhet III on I Shemu 1. He further argued that I Shemu 1 is included within the last month of the account: IV Peret 17 to I Shemu 16. If this were the twelfth month of the lunar year, then the year would have begun on I Shemu 27 or 26 with the beginning of the lunar year following after *peret Sepdet* on I Shemu 1.

Parker was right to attribute pBerlin 10056 to Amenemhet III, but Senwosret III ruled only for 19 years, not 36. Therefore the correct date for *peret Sepdet* in 30 Amenemhet III is at least IV peret 26 or 28,

[76] Parker, *Calendars*, 31.
[77] For the fragmentary accounts, see Krauss, *Sothis*, 83–84.
[78] Luft, *Fixierung*, 74, and Pl. 13 provides a transcription and a photo of the complete account.
[79] Borchardt also noticed a possible relationship to summer solstice. It so happens that the summer solstice and the rising of Sothis at $\varphi = 24°$ coincided on July 9 (Jul.) in the 19th century BC. But since solstices are not attested in Egyptian calendric sources, by contrast to the rising of Sothis, it is pointless to relate the Illahun lunar year to summer solstice.
[80] Parker, *Calendars*, 37.

depending on whether Sothis rose on IV Peret 16 or IV Peret *18 in 7 Senwosret III. *Peret Sepdet* in IV Peret 26 or *28 fell in 31 Amenemhet III within IV Peret 17 to I Shemu 16, the last month of the account. Borchardt and Parker interpreted the dates before *nfrjjt-r* as first days, and the ones after as last days of an Egyptian lunar month, but Luft realized that "LD 2 *nfrjjt-r* LD1" is meant (see above Chapter III. 8). The Illahun lunar year may be interpreted as standard calendar, used and modified for a temple roster.

The Ebers Calendar As Another Example of the Sothis-based Lunar Calendar

Borchardt interpreted the Ebers calendar as an example of a Sothis-based lunar year of the type that he had recognized in the Illahun archive. According to him col. I (see Fig. III. 10.1) contains a series of lunar months.[81] Parker modified Borchardt's interpretation:[82] the date III Shemu 9 is common both to *peret Sepdet* and to the beginning of the lunar month *wep-renpet*, i.e. on III Shemu 9 in 9 Amenhotep I, a LD 1 and *peret Sepdet* coincided.

Gardiner disagreed,[83] but Hornung concurred with Parker,[84] utilizing III Shemu 9 as LD 1 for chronological purposes.[85] In the early 1980s Helck denied a correlation between the lunar months of col. I and the associated civil days in col. II, suggesting instead that the lunar month *wep renpet* could have begun on any day between III Shemu 9 and IV Shemu 8 in year 9 of Amenhotep I.[86] Furthermore, he proposed that *peret Sepdet* could have occurred on any day within the lunar month *wep renpet*. Helck's purpose was to eliminate an obstacle to his ultra short NK chronology characterised by a 15 year reign at most for Horemhab, and implying that year 9 of Amenhotep I was correspondingly later than 1506 BC, which excluded III Shemu 9 as a Sothic date.

Subsequently, Luft doubted that col. I refers to lunar months and explained it as a list of feasts celebrated on unspecified days within the

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[81] Borchardt, *Mittel*, 19–29.
[82] Parker, *Calendars*, 37–42.
[83] A. H. Gardiner, *RdE* 10 (1955), 18–22.
[84] Hornung, *Untersuchungen*, 16–17.
[85] E. Hornung, *ZDMG* 117 (1967), 14–15, cf. also W. Barta, *ZÄS* 110 (1979), 2.
[86] Helck (n. 60); idem, *SAK* 15 (1988), 163.

civil months of col. II;[87] the latter he identified as months of the regnal year, following a suggestion of Barta.[88] Beckerath argued against Luft's interpretation of col. I; he also rejected the utilization of the nonexistent months of the regnal year.[89]

Whereas it follows from a straightforward reading of the Ebers calendar that Sothis rose on III Shemu 9, the identification of III Shemu 9 as LD 1 presupposes the identification of the Ebers calendar as another example of a Sothis-based lunar year of the Illahun type. Parker discussed other sources which possibly attest a Sothis-based lunar calendar, but these are liable to justifiably different interpretations and should not be used to elucidate the Ebers calendar. However, two arguments may be adduced to strengthen Parker's case.

Without any recourse to calendrical theory, Kitchen has concluded that Amenhotep I reigned between 1515 and 1494 BC, implying as noted above that year 9 = 1507/06 BC.[90] Because III Shemu 9 coincided in 1506 BC with a LD 1, Kitchen confirms, if unintentionally, Parker's lunar interpretation of the Ebers date.[91]

The possibility of projecting the Illahun lunar year backwards and forwards can also be utilized in support of Parker. If *peret* Sepdet is shifted from IV peret 26 or *28 in 30 Amenemhet III to III Shemu 9, keeping in mind that 30 Amenemhet III can be the first or the last year of a quadrennium, then the shift corresponds to 72 or *70 quadrennia ± 3 years + 43 days each or 288 ± 3 years or *280 years ± 3 years. If the LD 1 that fell on I Shemu 26 in 30 Amenemhet III is projected over the same interval by using mean synodic months,[92] it coincides with IV Shemu 9 as first lunar day *after* peret Sepdet, as Tables III. 10. 2a.b shows.

According to the projection there was a coincidence of IV Shemu 9 and a LD 1 after *peret Sepdet* on III Shemu 9, 282 years after 30 Amenemhet III. It is clear that in the same projected year *peret Sepdet* coincided with a LD 1 on III Shemu 9.[93] This implies that the Ebers

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[87] Luft (n. 61), 69–71.
[88] Barta (n. 62).
[89] Beckerath (n. 65), 28–31.
[90] K. A. Kitchen, *Acta Archeologica* 67 (1996), 12.
[91] III Shemu 9 corresponded to LD –1 in 1531, to LD 2 in 1517, to LD 1 in 1506, to LD –1 in 1495, and to LD 2 in 1492 BC; cf. also Krauss, *Sothis*, 109.
[92] For example, the intervall of 3426 mean lunar months corresponds to 101171.8 days. Thus the day that fell 3426 mean lunar months after I Shemu 26 in 1788 BC corresponded to IV Shemu 3.
[93] There is no such result, if *peret Sepdet* fell on IV Peret 16 in 7 Senwosret III.

Table III. 10.2a

Years after 30 Amenemhet III	Lunations since I Shemu 26	LD 1 *after* III Shemu 9
277	3426	IV Shemu 3
278	3438	III Shemu 22
279	3450	III Shemu 12
280	3463	III Shemu 30
281	3475	III Shemu 20
282	3488	IV Shemu 9
283	3500	III Shemu 28

Table III. 10.2b

Years after 30 Amenemhet III	Lunations since I Shemu 26	LD 1 *after* III Shemu 9
285	3525	IV Shemu 6
286	3537	III Shemu 25
287	3549	III Shemu 15
288	3562	IV Shemu 4
289	3574	III Shemu 23
290	3586	III Shemu 13
291	3599	IV Shemu 2

calendar represents a Sothis-based lunar year of the Illahun type,[94] and it eliminates the argument that the Ebers calendar is without parallel and thus only "proves itself" (so Belmonte).

Unusual Features of the Ebers Calendar

One peculiar feature of the Ebers calendar is the position of the months *wep renpet* and *techi* at first and second position. These two months are otherwise known as the 12th or last month and first month respectively. According to Borchardt the Sothis-based lunar year, as exemplified in the Ebers calendar, began with the intercalary lunar month *wep renpet*. Parker accepted that the Sothis-based lunar year could begin

[94] Following Barta, *ZÄS* 110 (1983), 19–25, Beckerath, *Chronologie*, 50, presumes that the Ebers calendar represents the civil-based lunar calendar.

with the intercalary month, but he argued against the identification of the intercalary month as *wep renpet*. Independent of the Ebers calendar, he had hypothesized the existence of an intercalary month "*d̲hwtyt*"; he emphasized that *wep renpet* is the name of the 12th month, and denied the possibility that the intercalary 13th month could bear the same name. But Parker's intercalary month "*d̲hwtyt*" is fictitious, and it is quite possible that the name of an intercalary 13th month is the same as the preceding 12th month.[95]

Provided that the accession day of Amenhotep I lay on III Shemu 9, it will have been its coincidence with *peret Sepdet* and the first day of the lunar month in which *peret Sepdet* occurred, that prompted a scribe to record the calendric situation in regnal year 9. The last month of a Sothis-based lunar year began on the accession day, and a new Sothis-based lunar year began a lunar month later. Disregarding the overlapping of two lunar years, the scribe listed a series of 12 months, corresponding to the standard format of a single year. To each lunar month he allotted the standard length of 30 days;[96] according to standard procedure he omitted the epagomenai. Thus the Ebers calendar can be explained as the Sothis-based lunar year of the Illahun type, adapted to a regnal year in order to make known and commemorate the very rare coincidence of a royal accession day with the beginning of an intercalary lunar month in which *peret Sepdet* occurred.

The coincidence of *peret Sepdet* and the first lunar day of a 13th lunar month tended to occur each 19 Egyptian years less 4 to 5 days. The coincidence occurred because the rising day of Sothis stayed the same over centuries in the Julian calendar while lunar dates tend to repeat after 19 Julian years = 19 Egyptian years less 4 to 5 days (Metonic cycle). The coincidence of an accession day and *peret Sepdet* was only possible during the NK and the TIP when regnal years began with the accession day; in fact, the occurrence in year 9 of Amenhotep I may have been the only one of its kind.

[95] Krauss, *Sothis*, 112–115; cf. also J. S. Nolan, "The Original Lunar Calendar and Cattle Counts in Old Kingdom Egypt", in: AH 17 (2003), 84–88.

[96] Cf. A. J. Spalinger, rev. of Leitz, *Studien*, in: *OLZ* 87 (1992), 25, pointing out that the Babylonians had also set up a schematic 360 day lunar year composed of twelve months each containing 30 days.

III. 11 FOUNDATIONS OF DAY-EXACT CHRONOLOGY: 690 BC–332 BC

Leo Depuydt

Of only three rulers of Egypt before the Roman conquest of 30 BC do we know the exact day of death in absolute terms, that is, can we define the distance in time to the present precisely. They are Psammetichus II, Alexander the Great, and Ptolemy VIII Euergetes II. Only Psammetichus II reigned in the period covered by this handbook. A stela dedicated to his daughter, the God's Wife Ankhnesneferibre, states: *rnpt-zp 7 ꜣbd 1 ꜣḫt sw 23 pr nṯr pn . . . psmṯk r pt* "Year 7, Month 1 of the *ꜣḫt*-season (first month of the year), Day 23, this god . . . Psammetichus went up to heaven."[1] Year 7 Month 1 Day 23 of Psammetichus II is most probably 9 Feb 589 BC. The event happened in the period of Egyptian history for which a widely accepted chronological model is available that allows dating to the exact day. The period begins with Taharqa's reign about 690 BC and spans most of the seventh to fifth centuries BC. Nowhere else in that period—and not anywhere before it—can events be dated absolutely to the exact day.[2] It is all of history's earliest period of day-exact dating. From about 400 BC, day-exact dating is suspended for a few decades. It resumes with Nectanebo II's reign in the 350s and 340s BC. Uncertainty then returns for a few years due to a lack of sources. With Alexander's conquest in 332 BC, day-exact dating resumes once more, never to cease again. Day-exact dating is a topic with sharply defined contours deserving treatment in

[1] G. Maspero, "Deux monuments de la princesse Ankhnasnofiribrî", *ASAE* 5 (1904), 84–90.

[2] For converting Egyptian dates into Julian dates, that is, into our modern calendar extended backward into the past, a table listing the Julian equivalent for Day 1 of every Egyptian month in the period at hand is found in P. W. Pestman (with S. P. Vleeming), *Les papyrus démotiques de Tsenhor* (Leuven: Studia demotica 4, 1994), 167–183. In this table, the years before Taharqa are hypothetical, those of the fourth century BC are approximate, and the beginning of Nectanebo II's reign is dated two years earlier than will be proposed here in section 3 of Chapter II. 11. For tables listing only the Julian equivalent only of Day 1 of the whole year, see section 4 in Chapter II. 11; also Ginzel, *Handbuch* II, 576–585; E. J. Bickerman, *Chronology of the Ancient World* (Ithaca, 1980²), 115–122.

its own right. What follows is an outline of its foundations. A comprehensive account remains desirable. This Chapter's focus is on general principles. For chronological details about the period's dynasties see Chapter II. 11.

1. *Concepts of Time-reckoning*: 1.1. *Calendars*

Three calendrical structures are relevant: the Egyptian civil calendar, Egyptian lunar time-reckoning, and the Babylonian lunisolar calendar. Throughout Egyptian history, the civil calendar was the dominant calendar of daily life. Details about its structure, its 12 months of 30 days plus five epagomenal days, and its three seasons of four months, *Akhet*, *Peret*, and *Shemu*, appear elsewhere in this handbook (see Chapter I. 5). In what follows, they will be called Months 1 through 12. Month-names have also been preserved.[3] In the period at hand, the names appear almost exclusively in fifth century BC Aramaic papyri from Egypt. The Greek variants are now conventionally used in modern historiography. One form for each, along with the Egyptian origin, is as follows:

1	Thoth	*ḏḥwty*	7	Phamenoth	*p n jmn ḥtp*
2	Phaophi	*p n jpt*	8	Pharmouthi	*p n rnnwtt*
3	Hathyr	*ḥwt ḥr*	9	Pachons	*p n ḫnsw*
4	Choiak	*kꜣ ḥr kꜣ*	10	Payni	*p n jnt*
5	Tybi	*tꜣ ꜥbt*	11	Epeiph	*jpjp*
6	Mecheir	*mḫr*	12	Mesore	*mswt rꜥ*

The Egyptian 365-day year is almost a quarter day shorter than the solar year, or cycle of seasons, of about 365.2422 days. The Egyptian year therefore wanders or shifts in relation to the solar year at a rate of about one day in four years, and of exactly one day in four years in relation to the Julian calendar year of 365.25 days (that is, three years of 365 days followed by one of 366). The Egyptian new year returns to the same day in the Julian calendar in exactly 1460 (365 × 4) years. In 664 BC, new year fell on 5 February for the first of four successive years. By 332 BC, it had receded to 14 November. Two

[3] For a survey of the sources for these month-names in hieroglyphic Egyptian, Coptic, Greek, and Aramaic, see Depuydt, *Calendar*, 109–136.

new years fall in 521 BC, which is a leap year of 366 days, like all years BC divisible by 4 after subtracting 1: the first on 1 Jan 521 BC and the second 365 days later on 31 Dec 521 BC. New year then shifts to a day earlier in the Julian calendar, to 30 December, already in 517 BC, not in 516 BC.

Two kinds of lunar time-reckoning are relevant. The native Egyptian kind lived in the shadow of Egypt's civil calendar. It was used mainly for religious purposes. Native lunar dates play a crucial role in the chronology of Dynasties 26 and 30 (see sections 2 and 3 in Chapter II. 11. The Babylonian lunisolar calendar enters Egyptian history when Persia, which had adopted it,[4] conquered Egypt in or shortly before 525 BC.

There is not much room for lunar calendars to differ. They all follow the cycle of lunar phases. Astronomical lunar months are on average about 29.53 days long. Obviously, calendrical lunar months last a full number of days. The average 29.53 is obtained by alternating months of 29 days and of 30 days, with slightly more 30-day months because the average is just above 29.5. Lunar calendars differ mainly in two respects: (1) when the month begins; (2) how months are organized into years. As for (1), Babylonian and Egyptian lunar months began close to new moon or conjunction, the point in time when the moon is right between the earth and the sun and therefore invisible from the earth.[5] As for (2), 12 months (on average about 354 days) are shorter than a solar year of about 365.2422 days and 13 months (on average almost 384 days) are longer. The average of 365.2422 is obtained

[4] Persian kings may have used accession dating in their native Persia (see L. Depuydt, "Evidence for Accession Dating under the Achaemenids", *JAOS* 115 (1995), 193–204), with regnal years lasting from the accession to the successive anniversaries of the accession.

[5] As to how close, see L. Depuydt, "The Date of Death of Jesus of Nazareth", *JAOS* 122 (2002), 466–80, at 471–477. It is now often stated, following Parker (*Calendars*, 10), that the Egyptian lunar Day 1 was the day that follows the day in the morning of which the last crescent is last sighted. The last crescent is last seen above the eastern horizon, rising ahead of the sun, one to two days before conjunction. However, the evidence, which includes civil-lunar double dates, proves only that the Egyptians did not wait for first crescent visibility, which occurs one to two days *after* conjunction. Lunar months began a little earlier. In fact, nowhere in the ancient world, Classical or Near Eastern, is there positive evidence that first crescent visibility marked the beginnings of lunar months. The role of first crescent visibility is one of the most overrated assumptions of ancient history. The Muslim calendar is an exception. But it may be alone. Babylonian astronomical texts, mentioned elsewhere (Depuydt, *JAOS* 122, 471) as a second exception, may actually not be one, as I hope to show in another place.

by alternating years of 12 months and years of 13 in a 19-year cycle containing 12 years of 12 months and 7 years of 13. That is because 235 (12 × 12 + 7 × 13) lunar months are roughly as long as 19 solar years. From the fourth century BC, and already mostly earlier, the years with 13 months are years 3, 6, 8, 11, 14, 17, and 19 of the cycle. In heeding both moon and sun, the Babylonian calendar is called lunisolar. Month 1, Nisanu, begins around a new moon close to the spring equinox, in later March or in April. The Babylonian month-names, in one variant each, are as follows. The derived Hebrew set is also listed.

Babylonian	Hebrew
Nisanu	Nisan
Aiaru	Iyyar
Simanu	Sivan
Duzu	Tammuz
Abu	Ab
Ululu	Elul
Tashritu	Tishri
Arahsamnu	Heshvan
Kislimu	Kislev
Tebetu	Tebeth
Shabatu	Shebat
Addaru	Adar

1.2. *Year-counting*

Calendars account for how days add up to months and months add up to years. That leaves counting the years. The year-count recommenced with each new reign in ancient Egypt. Two systems are relevant here. Predating was used in Dynasty 26, even if a formal proof is still desirable, and presumably also in Dynasties 28–30.[6] Predating of postdating was used in the Persian Dynasty 27, and presumably also in the short Persian Dynasty 31, for which evidence is scarce.[7] A fictional

[6] See Gardiner, "Years", 11–28.

[7] No single principle is more important to the chronological structure of 664 BC–332 BC than predating of postdating. For details, see L. Depuydt, "Regnal Years and Civil Calendar in Achaemenid Egypt", *JEA* 81 (1995), 151–73. For the special case of Cambyses, first ruler of Dynasty 27, see id., "Egyptian Regnal Dating under Cambyses and the Date of the Persian Conquest", in: *Studies in Honor of William Kelly Simpson*

example involving a king assuming power on 1 Sep AD 2001 may illustrate both systems. Let us assume that the Egyptian new year falls on 1 January.

In Egyptian predating, Year 1 lasts four months, from 1 Sep 2001 to 31 Dec 2001. A new regnal year begins on 1 Jan 2002. Regnal years and calendar years are henceforth coterminous. The old king's last regnal year, lasting from 1 Jan 2001 to 31 Aug 2001, and the new king's first together form a whole calendar year. This system is called predating because the beginning of regnal Year 2 on 1 Jan 2002 precedes the beginning of the full second year of reign on 1 Sep 2002.

In Babylon, new year began around a new moon close to the spring equinox in late March or in April, let us assume 21 March for argument's sake. In Babylonian postdating, the eight months from the reign's beginning on 1 Sep 2001 to 20 Mar 2002 are not counted and called "head (beginning) of the reign" or the like. It is a numberless accession year. This is postdating because the beginning of regnal Year 2 on the Babylonian new year of 21 Mar 2003 follows the beginning of the full second year of reign on 1 Sep 2002.

In Egyptian-Babylonian predating of postdating, postdated Babylonian regnal years of Persian kings are predated in Egypt. The reign's first Babylonian new year in the spring was for all practical purposes taken as the reign's beginning in Egypt. Persian-Egyptian regnal years are predated in relation to the postdated beginning of the reign, the Babylonian new year.

In predating, the beginning of regnal Year 2 precedes the beginning of the full second year of reign. In postdating, it follows. In predating of postdating, both are possible, following or preceding. All depends on when the reign begins. A twofold distinction applies. In case one, the Persian reign begins between the Babylonian and Egyptian new years. Following applies. Postdating has an effect. In case two, the Persian reign begins between the Egyptian and Babylonian new years. Preceding applies, as in pure predating. Postdating has no effect.

(Boston, 1996), 179–190; W. Barta, "Zur Datierungspraxis in Ägypten unter Kambyses und Dareios I", *ZÄS* 119 (1992), 82–90; cf. also D. Devauchelle, "Un problème de chronologie sous Cambyse", *Transeuphratène* 15 (1998), 9–17. F. X. Kugler had earlier indirectly noted the principle of predating to postdating (*Sternkunde und Sterndienst in Babel* (Münster, 1907–24), vol. 2.2.2, 190–1), but in reference to the years of Ptolemy's Canon only, not to actual historical regnal years, and also without distinguishing between the two distinct cases to be described next. In the Canon, the lengths of all the reigns are converted into multiples of the Egyptian calendar year, that is, into multiples of 365 days.

Regnal Year 2 of a king assuming power on 15 Dec 2001, between the Babylonian and Egyptian new years, begins on 1 Jan 2002, that is, before the second full year of reign begins. Regnal Year 2 of a king assuming power a month later, on 15 January, between the Egyptian and Babylonian new years, begins on 1 Jan 2003, that is after the second full year of reign begins.

Xerxes I's reign illustrates case one. It began in late Nov 486 BC. The Egyptian new year soon followed on 23 Dec 486 BC. Babylonian regnal Year 1 began about 4 Apr 485 BC. By about 4 Apr 485 BC, Egyptian regnal Year 1 must have begun as well, probably not earlier. Egyptian regnal Year 2 began on 22 Dec 485 BC, on the reign's second Egyptian new year. The reign's beginning fell between the Babylonian and Egyptian new years. Egyptian regnal Year 2 therefore began on the second Egyptian new year of the reign, and after the beginning of the second full year of reign in late Nov 485 BC.[8]

Darius II's reign illustrates case two. It began in all probability in 25 Dec 424 BC–13 Feb 423 BC,[9] after the Egyptian new year of 7 Dec 424 BC. The Babylonian regnal Year 1 began on or close to 31 Mar 423 BC. By that day, Egyptian regnal Year 1 must have begun, probably not earlier. Egyptian regnal Year 2 then began on 7 Dec 423 BC, the reign's first Egyptian new year. The reign's beginning fell between the Egyptian and Babylonian new years. Regnal Year 2 therefore began on the first Egyptian new year of the reign, as in pure predating, and before the beginning of the second full year of reign, which fell after 24 Dec 423 BC in the Egyptian civil calendar.

A lack of evidence prevents establishing whether Artaxerxes II's reign is case one or case two. The reign began between about 17 Sep 405 BC and about 10 Apr 404 BC. The Egyptian new year of 2 Dec 405 BC falls inside this period.

2. *Four Key Sources*

Four sources of wider scope are fundamental to day-exact dating. Additional sources of narrower scope are adduced in the Chapter on

[8] A full year of reign, or the time from accession to the first anniversary of the accession, is here taken at 365 days. We are after all in Egypt.

[9] See L. Depuydt, "The Date of Death of Artaxerxes I", *WdO* 26 (1995), 86–96.

the chronology of Dynasties 26 to 31 (see Chapter II. 11). Ptolemy's Canon is the anchor source. It fixes Dynasty 27 in time, and hence indirectly also the other dynasties. The Canon is supported in this role—and will in the future be entirely replaced in it—by Babylonian astronomical texts. These texts cement the Canon's veracity. A second anchor, dependent on the Canon, is a set of Serapeum stelae. These stelae mostly fix the reigns of Dynasty 26 in relation to the previously fixed Dynasty 27.

2.1. *Ptolemy's Royal Canon* The Canon remains the foundation of ancient Near Eastern chronology in the first millennium BC.[10] An adaptation of the relevant portion's Greek original is as follows.

Ptolemy's Canon of Kings, Segment Relevant to Saite and Persian Egypt

King's Name	Years Reigned	Total
Nabonassar	14	14
Nabu-nadin-zeri	2	16
Mukin-zeri and Pul	5	21
. . .		
Cyrus	9	218
Cambyses	8	226
Darius I	36	262
Xerxes I	21	283
Artaxerxes I	41	324
Darius II	19	343
Artaxerxes II	46	389
Artaxerxes III	21	410
Arses	2	412
Darius III	4	416
Alexander the Great	8	424

[10] For an analysis, see L. Depuydt, "'More Valuable than All Gold': Ptolemy's Royal Canon and Babylonian Chronology", *JCS* 47 (1995), 97–117. The foundation is shifting, however; see id., "The Shifting Foundation of Ancient Chronology", in: *Modern Trends in European Egyptology* (British Archaeological Reports S1448; Oxford, 2005), 53–62, and id., "Ancient Chronology's Alpha and Egyptian Chronology's Debt to Babylon" (to appear in a Festschrift).

The Canon's diminutive size belies its importance. Its three columns provide: (1) the ruler's name; (2) the length of reign in a number of full 365-day Egyptian civil years; (3) the cumulative total of years from Nabonassar, the Canon's first king. The cumulative count is also known as the Era of Nabonassar. Year 1 of Cambyses, ruler no. 22, is Year 219 from Nabonassar. 218 years precede. The first day of the first year of the Canon is 26 Feb 747 BC. The Egyptian years wander in relation to the Julian calendar (see 1.1 above). The Canon may now be expanded as follows.

Ptolemy's Canon of Kings, Segment Relevant to Saite and Persian Egypt

King's Name	*Length of Reign in Full Egyptian Civil Years*
Nabonassar	26 Feb 747–22 Feb 733
Nabu-nadin-zeri	23 Feb 733–21 Feb 731
Mukin-zeri and Pul	22 Feb 731–20 Feb 726
. . . .	
Cyrus	5 Jan 538–2 Jan 529
Cambyses	3 Jan 529–31 Dec 522
Darius I	1 Jan 521–22 Dec 486
Xerxes I	23 Dec 486–16 Dec 465
Artaxerxes I	17 Dec 465–6 Dec 424
Darius II	7 Dec 424–1 Dec 405
Artaxerxes II	2 Dec 405–20 Nov 359
Artaxerxes III	21 Nov 359–15 Nov 338
Arses	16 Nov 338–14 Nov 336
Darius III	15 Nov 336–13 Nov 332
Alexander the Great	14 Nov 332–11 Nov 324

The two dates in each line are Day 1 and Day 365 of an Egyptian year. Babylonian regnal Year 1 began on the first Babylonian new year of the reign in late March or in April, namely in the springs of 747, 733, 731, 538, 529, 521, 485, 464, 423, 404, 358, 337, 335, 331, and 323 BC. The reign of course begins earlier, up to as much as a year earlier. The Canon's reigns begin on the Egyptian new year that precedes the reign's first Babylonian new year. As a result, the reign's historical beginning can both precede and follow the Canon's beginning (cf. the related distinction between the two cases in 1.2). Xerxes I's

reign began before the Canon's beginning of 23 Dec 486 BC. Darius II's reign began after the Canon's beginning of 7 Dec 424 BC.

2.2. *Serapeum Stelae* Many of the stelae found in the tombs of the Apis bulls in the Serapeum in Memphis list the exact dates of birth and death of people and bulls along with their life-span to the day. If the person or bull was born under one king and died under another, the first king's length of reign can be inferred. Such inferences provide the chronological skeleton of Dynasty 26.[11] One example will need to suffice. According to stela Louvre 193, an Apis was born in Year 53 Month 6 Day 19 of Psammetichus I, died in Year 16 Month 2 Day 6 of Necho II, and lived 16 years 7 months 17 days, that is, 16 years and 227 (7 × 30 + 17) days. The two fractions of a year that the bull lived in Year 53 of Psammetichus I and in Year 16 of Necho II add up to 232 days, excluding apparently Month 6 Day 19, the date of birth, from the count. That is five days less than the 227 days given in the text. Evidently, the five epagomenal days are erroneously not counted.[12] That leaves 16 full 365-day years to be identified. Necho II's Years 2–15 are 14 of them. That leaves two. According to predating (see 1.1), one must be the 365-day year encompassing Psammetichus I's last regnal year and Necho II's first. One last full year now still needs to be accounted for. It cannot be but Psammetichus I's Year 54, a full 365-day year, lasting from new year to new year. Year 55, a regnal year shorter than 365 days, was then presumably his last.

2.3. *The Cuneiform Record* From 525 BC or shortly before, Persia ruled both Egypt and Mesopotamia. Rulers of Egypt were now dated continuously in cuneiform tablets by the Babylonian calendar. Cuneiform evidence thus becomes directly relevant for Egyptian chronology. R. A. Parker and W. H. Dubberstein have collected what the cuneiform record transmits about three aspects of the Babylonian calendar: (1) which lunar months had 29 days and which 30 days; (2) which years had 12 months and which 13 months; (3) on which day daylight of each lunar Day 1 fell.[13] The following line from their tables describes Darius II's Babylonian regnal Year 1.

[11] For a tabulation of the key evidence, see Kienitz, *Ägypten*, 154–59. See earlier Wiedemann, *Geschichte*, 115–21; see also Gardiner, "Years", 17–20.

[12] So already Gardiner, "Years", 17.

[13] Parker & Dubberstein, *Chronology*. Evidence that has emerged since would make

1 423 4/11 5/11 6/9 7/9 8/7 9/5 10/5 11/3 12/3 422 1/1 1/31 3/1

This line is to be interpreted as follows. Month 1 (Nisanu) of Year "1" began about 11 Apr 423 BC ("423 4/11"), Month 2 (Aiaru) about 11 May 423 BC ("5/11"), and so on. Month 12 (Addaru) began about 1 Mar 422 BC ("422 . . . 3/1"). Most of the Julian dates for lunar Day 1 in Parker's and Dubberstein's tables are obtained by computation. These computations are based on the assumption that the first crescent could have been seen in the evening preceding daylight of lunar Day 1, that is, in the evenings on 10 April, 10 May, and 28 February. The first crescent is first seen in the evening one or two days after conjunction. The conjunctions in question occurred about 3:56AM on 9 Apr 423 BC, about 6:52PM on 8 May 423 BC, and about 1:22PM on 27 Feb 422 BC.[14] It is important to note that a Julian day date of an ancient lunar Day 1 may be off by one to two days from the actual historical beginning. It is certain that lunar Day 1 was always close to conjunction, but it can no longer be known for most lunar months exactly how close, hence the description "about 11 Apr 423 BC," and not just "11 Apr 423 BC" for lunar dates throughout this Chapter and Chapter II. 11.

Once the course of the Babylonian calendar is reconstructed, the earliest and latest attested dates for each reign provide approximate dates for the reigns' beginnings (see sections 1 and 4 in Chapter II. 11).

2.4. *Aramaic Double Dates* Aramaic papyri from Egypt dating to the fifth century BC have yielded a remarkable set of Egyptian-Babylonian double dates. Double dates date single documents by both the Egyptian civil calendar and the Babylonian lunisolar calendar. The fact that the two independently obtained Julian equivalents of the Egyptian and Babylonian dates as a rule match serves as an absolute guarantee of the correctness of our understanding, at least from the fifth century BC onward, of both calendars, of our understanding of the dating of Egyptian history, and of our understanding of the Egyptian year's wandering motion. The persistent match also adds confidence to the established understanding of earlier Egyptian chronology. That by itself is

an update desirable. On the cuneiform record, see now also C. O. Johnson, *The Gentile Times Reconsidered: Chronology and Christ's Return*, Third Edition (Atlanta, 1998).

[14] Goldstine, *Moons*.

a paramount contribution of these double dates to Egyptian chronology,[15] in addition to sundry detail regarding the dating of individual kings.

For a list of the completely preserved double dates see Table III. 11.1.[16] Columns (1) and (2) list what is in the text. The texts give the month-names in Aramaic garb. The familiar Hebrew and Greek forms are used here. The equation (1) = (2) found in the texts is reduced to lunar Day 1 in column (3). On the one hand, the Julian date of the Egyptian equivalent of lunar Day 1 is known because the course of the Egyptian wandering year is fully transparent ((4)). On the other hand, so is the time of conjunction or new moon through computation using formulas of lunar motion (see (5)).[17] A comparison of (4) and (5) reveals that, strikingly, lunar months begin around conjunction.[18]

3. *The Limits of History's Earliest Day-exact Chronology*

Day-exact chronology sets in with Taharqa's Year 1, the 365-day year 12 Feb 690 BC–11 Feb 689 BC, or perhaps 12 Feb 691 BC–11 Feb 690 BC (see section 2 in Chapter II. 11). But day-exact is inactive and merely potential without actual dated events of history. The earliest day-exact date is I *Peret* 10 (Month 5 Day 10) of Taharqa's Year 3, the date of papyrus Louvre E3228d, which concerns the sale of a slave.[19] That would be 20 Jun 688 BC. Considering the uncertainty regarding Taharqa's Year 1, a more secure earliest day-exact date is the first dated event of Psammetichus I's reign, namely Month 1 (I *Akhet*) Day

[15] Depuydt, "Consistency", 53–4. On special problems regarding double dates nos. 3 and 10 and on statistical considerations supporting the foundational value of the Aramaic evidence, see now sections 4.3 and 4.4 in: L. Depuydt, "Calendars and Years in Ancient Egypt" (forthcoming in the Acts of a session on "Calendars and Years" held at the 2005 Notre Dame Workshop on the History of Astronomy).

[16] The manuscript sigla are those of B. Porten's and A. Yardeni's comprehensive *Textbook of Aramaic Documents from Ancient Egypt*, 4 vols. (Jerusalem, 1986–99).

[17] The times are Goldstine's (*Moons*) for Babylon, minus 53 minutes for Memphis, or minus 47 minutes for Aswan.

[18] Apparently, they began on average a little too early for the first crescent to have been visible in the evening preceding daylight of Day 1 (see note 5).

[19] See Depuydt, "Consistency", 52. At 52a, line 19, for '11 June 688 BCE' read '20 June 688 BCE'. At 52a, note 42, line 3, for 'Month 10 Day 23' read 'Month 11 Day 23'.

28 of his Year 9, or 2 Mar 656 BC. On this day, the Nitocris Adoption stela states, princess Nitocris departed from Sais.[20]

Day-exact chronology is suspended for several decades when Persian rule over Egypt ends around 400 BC. The latest exact dates appear in Aramaic papyri. The latest complete one is Month 1 Day 12 (12 Thoth) of Year 4 of Artaxerxes II, that is, 13 Dec 402 BC.[21] If the Artaxerxes associated with a date of Month 2 Day 18 (18 Phaophi) of Year 4 is indeed the second king of that name, as he appears to be,[22] then 18 Jan 401 BC would be the latest date.

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[20] Cf. Kienitz, *Geschichte*, 15.

[21] Papyrus "B3.12" in: Porten & Yardeni, *Textbook* (n. 16), vol. 2.

[22] B. Porten, "The Calendar of Aramaic Texts from Achaemenid and Ptolemaic Egypt", in: *Irano-Judaica*, II: *Studies Relating to Jewish Contacts with Persian Culture throughout the Ages*, Sh. Shaked & A. Netzer, eds., (Jerusalem, 1990), 13–32, at 19 (document "C.43").

Table III. 11.1. Completely Preserved Double Dates in Aramaic Papyri from Egypt

	Text	(1) Egyptian Date	(2) Babylonian Lunar Date	(3) Equation (1) = (2) Converted for Babylonian Day 1	(4) Daylight of Egyptian Date in (3)	(5) New Moon Closest to (4)	
No. 1	C3.8	9 Choiak Year 15 of Xerxes I	24 Adar Year 14	16 Hathyr = 1 Adar	4 Mar 471	1 Mar	2:41PM
No. 2	B2.1	28 Pachons Year 5 of Xerxes I	18 Elul	11 Pachons = 1 Elul	26 Aug 471	24 Aug	6:13PM
No. 3	B3.1	4 Thoth Year 9 of Artaxerxes I	7 Kislev	3 epagomenal = 1 Kislev	12 Dec 457	16 Dec	8:06AM
No. 4	B3.2	25 Phamenoth Year 14 of Artaxerxes I	20 Sivan	6 Phamenoth = 1 Sivan	17 Jun 451	16 Jun	1:59PM
No. 5	B2.7	10 Mesore Year 19 of Artaxerxes I	2 Kislev	9 Mesore = 1 Kislev	16 Nov 446	16 Nov	5:17AM
No. 6	B2.8	19 Pachons Year 25 of Artaxerxes I	14 Ab	6 Pachons = 1Ab	13 Aug 440	12 Aug	7:16PM
No. 7	B3.4	9 Payni Year 28 of Artaxerxes I	7 Elul	3 Payni = 1 Elul	8 Sep 437	7 Sep	12:02PM
No. 8	B3.5	25 Epeiph Year 31 of Artaxerxes I	25 Tishri	1 Epeiph = 1 Tishri	6 Oct 434	4 Oct	8:43AM
No. 9	B3.6	7 Phamenoth Year 38 of Artaxerxes I	20 Sivan	18 Mecheir = 1 Sivan	24 May 427	22 May	4:58AM
No. 10	B3.9	22 Payni Year 8 of Darius II	6 Tishri	17 Payni = 1 Tishri	17 Sep 416	15 Sep	5:32AM
No. 11	B2.10	12 Thoth Year 9 of Darius II	3 Kislev	10 Thoth = 1 Kislev	14 Dec 416	12 Dec	11:52PM
No. 12	B2.11	9 Hathor Year 14 of Darius II	24 Shebat	16 Phaophi = 1 Shebat	18 Jan 410	17 Jan	2:54AM
No. 13	B3.10	29 Mesore Year 1 of Artaxerxes II	24 Marcheshvan	6 Mesore = 1 Marcheshvan	2 Nov 404	1 Nov	10:41AM
No. 14	B3.11	8 Choiak Year 3 of Artaxerxes II	20 Adar	19 Hathyr = 1 Adar	18 Feb 402	16 Feb	8:14PM

PART IV

CONCLUSIONS AND CHRONOLOGICAL TABLES

IV. 1 CONCLUSIONS

Rolf Krauss and David Alan Warburton

From Dyn. 27 Back to Early Dyn. 22

The chronology of Dyn. 27, also known as the First Persian Period, is fixed by Ptolemy's Canon. Analysis of a series of Serapeum and biographical stelae provides the chronological framework for Dyn. 26, with the exception of the reign of Amasis who ruled for 43 or 44 years. Parker solved this problem in favour of 44 years by utilizing a lunar date from year 12 of Amasis, setting year 1 of Psammetichus I in 664 BC. A Serapeum stela linking Psammetichus I to Taharqa and other dated sources yield 690 BC as the latter's year 1 (Chapter II. 11). Dated documents of Taharqa's predecessor Shebitku are few, but according to the Tang-i Var inscription, regnal year 1 of Shebitku corresponded to 706 BC at the latest (Chapter II. 12). His predecessor Shabaka ruled at least into a year 15; at the beginning of his reign, he defeated Bocchoris of Memphis. Using dead reckoning 723/22 BC is the latest possible date for year 6 of Bocchoris. There is a gap between Bocchoris's predecessor Tefnakhte and the last king of Dyn. 22, Shoshenq V. 26 years at most, the lifespan of the Apis buried in year 6 of Bocchoris, bridges the gap. This Apis was the successor of the bull that died in year 37 of Shoshenq V.

For dead reckoning back to the middle years of Dyn. 22 we follow Aston's reconstruction of the period's history which differs in certain points from Kitchen's valuable analysis of the history of the Third Intermediate Period. According to Aston, there were parallel Memphite and Theban lines from Takelot II and Shoshenq III onwards; the Theban line fought at times with an Upper Egyptian rival (Chapter II.10). Precise dates for Dyn. 22 can be deduced by following the reasoning of Parker, Vernus, and Kruchten in interpreting the *Tepi Shemu* dates of the Late Period as lunar dates which most likely yield 1 Takelot II = 845, 1 Shoshenq III = 841 BC, and 1 Petubaste I = 834 BC (Chapter III. 8). The history and chronology of the Theban dynastic line after Petubaste I and Iuput I remain open, and the same applies to the Lower Egyptian Dyn. 23.

The chronology of early Dyn. 22 depends on dead reckoning. The sum of the highest attested regnal dates for Osorkon II, Takelot I, Osorkon I, and Shoshenq I, added to 841 BC as year 1 of Shoshenq III, yields 938 BC at the latest for year 1 of Shoshenq I (Chapter II. 10). The large Dakhla stela provides a lunar date in the form of a *wrš* feast in year 5 of Shoshenq [I], yielding 943 BC as his year 1 (Chapter III. 8). The traditional date of 945 BC for Shoshenq I's accession rests on a combination of Biblical and Egyptological information. There is, however, no basis for the projected Biblical dates, as no contemporary archaeological or epigraphical evidence provides any support for the generation counts in the Old Testament. It is true that the results of dead reckoning from the Egyptian sources seem to coincide roughly with the projected Biblical date for the raid on Jerusalem, but the Biblical source cannot provide support for the conjecture.

Dyn. 21

Dead reckoning of the highest attested dates for Psusennes II, Siamun, and ʿAkheperreʿ yields at least 13(?) + 17 + 2 = 42 years for the second half of Dyn. 21. Another six or perhaps even a few more years can be added, if year 19 mentioned on the large Dakhla stela is attributed to Psusennes II.

Young recognized that a "generation" elapsed between the induction of a priest in year 2 of King ʿAkheperreʿ and the induction of the priest's son in year 17 of Siamun. The distance implies a short reign for ʿAkheperreʿ and suggests his identification with "Osochor" < Osorkon, the predecessor of "Psinaches" according to Manetho, who ruled for 6 years. We conflate Young's thesis with Vernus's and Kruchten's interpretation of the inductions as occurring on lunar *Tepi Shemu* feasts. Thus 2 ʿAkheperreʿ = 990 BC and 17 Siamun = 970 BC, implying a reign of exactly 6 years for ʿAkheperreʿ. Manetho's figure for Osochor proves to be correct, but there is no guarantee that his figures for other kings of Dyn. 21 are also correct. Further confirmation for 2 ʿAkheperreʿ = 990 BC is provided by the date of an oracle in year 3 of [ʿAkheperreʿ] on the last day of the *Tepi Shemu* feast, i.e. on a lunar day 5. A gap of 8 unattested years remains between 17 Siamun = 970 BC and 962 BC as the latest possibility for year 1 of Psusennes II (Chapter III. 8).

Jansen-Winkeln questions whether the contemporaneous regnal years of the first half of Dyn. 21 refer to the Tanitic kings or to the Theban

High Priests; at present the problem remains unresolved (Chapter II. 9). The alternatives result in different dates for the first year of Dyn. 21. If the recorded regnal years refer to the Tanitic kings, at least 9 + 48 + 24 = 81 full years must be reckoned for Amenemope, Psusennes I, and Smendes. Jansen-Winkeln's model reckons with at least 48 + 24 + 5 = 77 full years for High Priests Menkheperreʿ, Pinudjem, and Herihor.

If the reconstruction of the inscription on the well-known linen wrapping strip is correct with [year x under] king Amenemope = year 49 [of High Priest Menkheperreʿ], there was an overlap of unknown length between Amenemope and Menkheperreʿ. The degree of uncertainty can only be somewhat minimized since it is highly probable that year 49 Menkheperreʿ = year 5 ± 4 of Amenemope, i.e., year 49 of Menkheperreʿ could be any year of Amenemope, from year 1 to year 9.

There are no contemporaneous dates for Amenemnisut; thus only the duration X (less than all of Amenemope's 10 years) of the presumed coregency of Psusennes I and Amenemope has to be considered, resulting in 1073 BC—X years at the latest for the beginning of Dyn. 21. Should 992/991 BC = 1 ʿAkheperreʿ Osorkon, then Dyn. 21 began in 1074 BC ± 4 years.

Although this chronology for Dyn. 21 rests on a methodologically unsatisfactory admixture of dead reckoning and presumed lunar dates, we arrive at a reasonably precise point of departure for the end of Dyn. 20.

From Dyn. 20 Back to Dyn. 19 (Chapter II. 8)

There is a gap between the beginning of Dyn. 21 and the reign of Ramesses XI, the last king of Dyn. 20. Egyptologists generally concede that his reign could have ended 1 or 2 years later than year 10 of the *weḥem mesut* era = regnal year 28. The reigns of Ramesses IX through XI add up to 49 y + 8 m, if their highest attested dates and accession dates are considered. The exact lengths of the reigns of Ramesses VIII and VII are unclear, but 1 year and 7 years, respectively, are certain. The sum of the highest undisputed dates of Ramesses III through VI is 8 + 4 + 7 + 31 = 50 years. Thus year 1 of Ramesses III corresponds to 1181 BC—X years or 1182 BC ± 4 years at the latest.

Between Ramesses III and Ramesses II there are two chronological problems, viz. the transition from Twosre to Sethnakhte and the position

of Amenmesses. Both questions are resolvable on the basis of Ramesside lunar dates (Chapter III. 8). Several lunar feast-of-the-valley dates supplement the Piramesses lunar date of year 56 of Ramesses II. Their mutual distances imply that Sethnakhte's reign of 3 years (incomplete) followed year 8 of Twosre; furthermore, the entire reign of Amenmesses was subsumed within Sety II's. Thus the distance between the accessions of Ramesses III and Sety II amounts to 16 y + 3 m. Since 9 y + ca. 5 m are attested for Merneptah and 66 years + ca. 2 months for Ramesses II, 1 Ramesses II corresponds to 1273 BC—X years or 1274 BC ± 4 years at the latest. On the basis of the Piramesses lunar date, Parker preferred 1290 BC as year 1 of Ramesses II, while admitting 1304 and 1279 BC as other possibilities. By contrast, Bierbrier decidedly favours 1279 BC, relying on his research into the genealogy of the late New Kingdom; Kitchen supports Bierbrier's argument. The best match for the astronomically possible equivalents for the Piramesses lunar date and the festival-of-the-valley lunar dates is 1279 BC. The degree of agreement is significantly less for 1304 BC, which is historically impossible; the remaining lower possibilities—1268 and 1265 BC—are excluded for astronomical reasons.

From Early Dyn. 19 Back to the Amarna Kings

Jansen-Winkeln gives cogent reasons why the biography of the High Priest Bakenkhonsu does not support a 15 year reign for Sety I (Chapter II. 8). His highest attested date is year 11; for his predecessor Ramesses I a year 2 is documented. For Haremhab, the series of regnal dates ends with year 13, but years 26 (oIFAO 1254) and 27 (oIFAO 1254, Medinet Habu graffito), are probably documented. This provides support for the interpretation of the regnal year 59 (or 58) mentioned in the Mes-inscription as 32 years of the Amarna rulers plus 27 years of Haremhab's own, as done traditionally. With 27 years, dead reckoning results in 1319 BC as year 1 of Haremhab. The comparative dearth of archaeological documentation would appear to suggest a shorter reign. However, such criteria must be weighed carefully. Helck experimented with 15 years for Haremhab; Beckerath among others does not follow him. The twin anchors of the known royal synchronisms for Dyns. 18 and 19 (see below), combined with the astronomical dates, would present substantial chronological anomalies if Haremhab's reign were shorter than 27 years. Only a long reign for Haremhab is com-

patible with these figures and with 1279 BC as year 1 of Ramesses II. Furthermore, without a long reign, the distance between 1508/03 BC as the latest possibility for the Ebers Sothic date and 1 Ramesses II = 1279 BC could not be covered.

The chronology of the period when Amarna was the residence seems clear (Chapter II. 8). Sixteen successive wine vintages, each representing a calendar year, occurred during the occupation of the site; 13 vintages correspond to years 5 through 17 of Akhenaten, whereas 3 vintages occurred under his successors. The first 2 of them are evidently to be attributed to King ʿAnkhkheprureʿ Smenkhkareʿ. Since Nebkheprureʿ Tutʿankhamun is attested at Amarna, the last vintage would seem to be datable to his regnal year 1. However, the last vintage is possibly attributable to Queen ʿAnkhetkheprureʿ, successor of ʿAnkhkheprureʿ Smenkhkareʿ. From year 1 of Akhenaten until the royal court left Amarna, 20 full years elapsed. Tutʿankhaten/Tutʿankhamun ruled at least 8 or 9 years (depending on the attribution of the last vintage on record at Amarna), and Aya 4 years which amounts to 33 or 32 years. Thus dead reckoning yields 1352/51 BC at the latest for 1 Akhenaten.

Near Eastern and Egyptian Synchronisms (Chapter II. 13)

To some extent, the synchronisms of Near Eastern and Egyptian rulers provide a basis for postulating absolute dates for this period. The preserved correspondence demonstrates that the reign of Ramesses II was contemporary with the reigns of the Hittite kings Muwattali and Hattushili; and likewise the reign of Akhenaten was contemporary with Shuppiluliuma I of Hatti, Tushratta of Mitanni, Ashshur-Uballit I of Assyria, and Burnaburiash II of Babylon. Whereas the reigns of the Hittite and Mitanni kings cannot be dated directly, the Assyrians and Babylonians can be dated with near precision, and linked to Hatti and Mitanni and thus also to the Egyptian historical relations with these countries. The proposal of Gasche et al. (*Dating*) is the only astronomically and archaeologically supported chronology available today. Although some debate persists about the first half of the second millennium, there is general agreement on rough dates for the reigns of Adad-nerari I (1300–1270 BC), Shalmaneser I (1269–1241 BC), Tukulti-Ninurta I (1240–1205 BC), and Ashshur-Uballit I (1356–1322 BC) of Assyria as well as for Kadashman-Enlil (1369–1355 BC), Burnaburiash II (1354–1328 BC) and Kadashman-Turgu (1276–1259 BC) of Babylon.

Correspondence preserved in the archives at Hattusha links Hattushili II of Hatti not only to Ramesses II, but likewise to the reign of Kadashman-Turgu and the period of Egyptian—Hittite conflict before the treaty of peace (year 21 Ramesses II) and after the accession of Hattushili, years after the battle of Kadesh (year 5). The same correspondence also allows a synchronism of Muwattali with Adad-nerari I immediately after the battle of Kadesh.

Amarna letter EA 7 was addressed to Akhenaten and written by Burnaburiash II. EA 6 was written by the same Burnaburiash II but addressed to an Egyptian king with a different name, and the text specifies that the father of Burnaburish maintained friendly relations with the recipient. EA 5 confirms that Kadashman-Enlil was in contact with Amenhotep III. Furthermore, EA 9, written by Burnaburiash II to Akhenaten, refers to the Assyrian messengers in Egypt mentioned by Ashshur-Uballit I in EA 16. The Amarna correspondence thus confirms that although Burnaburiash and Akhenaten were contemporaries, Burnaburiash came to the throne before the death of Amenhotep III; the synchronism of Ashshur-Uballit I and Burnaburiash II known from Mesopotamian sources can thus also be dated to the reign of Akhenaten, with an overlap for both rulers into the reigns of Akhenaten's immediate successors.

The Hattusha and Amarna correspondence document synchronisms between the first decades of Ramesses II's reign and the reigns of Kadashman-Turgu and Adad-nerari I, and that the accession of Akhenaten coincided with the reign of Burnaburiash. Therefore it is clear that a shift of any reign necessitates a commensurate change in the others. Since the anchors for the astronomical absolute dates and the historically relative dates for Mesopotamia and Egypt are fundamentally different, these synchronisms can be viewed as virtually certain.

From Amenhotep III Back to Thutmose III (Chapter II. 8)

The highest attested full years are 37 for Amenhotep III, 7 for Thutmose IV, 22 (or 25) for Amenhotep II, 53 for Thutmose III. Parker's arguments for a coregency of Thutmose III and Amenhotep II of more than 2 years are invalid. If there was any coregency at all, it amounted to 4 months at most. Adding half a year to each of the full years yields 1472 (or 1475) BC at the latest for year 1 of Thutmose III.

There are two lunar dates of Thutmose III, one referring to the foundation date of a temple at Karnak in year 24 and the other to the battle of Megiddo in year 23. Both dates have a complicated history of interpretation; whether the recorded dates ought to be emended or not is moot. Utilizing both possibilities results in 1479 BC = 1 Thutmose III as the only astronomically viable alternative.

Astronomical Determination of the Period between Thutmose III and Senwosret III Based on the Dates in the Illahun Archive and the Ebers Calendar

Dead reckoning and generation-counts do not provide a sufficient basis for a chronology of the Second Intermediate Period. However, the Ebers calendar and the Illahun archive furnish astronomical data enabling the limits of the period to be defined. It is a fact that the combined reigns of Thutmose II and I amounted to a minimum of 4 years. A comparison of the archaeological documentation for Thutmose I and II with Hatshepsut's yields 4 years for Thutmose II and 11 years for Thutmose I. But we shall not use these figures, because *exact* reign-lengths cannot be based upon archaeologically recoverable remains. The traditional argument that Manetho's Chebron is ʿAkheperenreʿ Thutmose II and that Chebron's 13 regnal years are to be emended to *3 years, is speculative. The two predecessors of Thutmose I—Amenhotep I and ʿAhmose—ruled, respectively, into a year 21 and at least into year 22. Thus on the basis of dead reckoning, year 1 ʿAhmose = 1526 BC at the latest.

The Ebers calendar refers to regnal year 9 of Amenhotep I. The discussion about the proper interpretation of the astronomical data in the Ebers calendar had achieved an initial consensus following Parker's study of 1950 and Hornung's of 1964. Accordingly, the rising of Sothis and a first day of lunar month *wep renpet* coincided on III Shemu 9 in regnal year 9 of Amenhotep I. Although there were methodological shortcomings associated with a challenge to this consensus mounted in the 1980's, it must be stressed that the discussion did produce the insight that the period covered by the Ebers calendar is concurrent with regnal year 9 of Amenhotep I, i.e. the accession day of the king very probably coincided with III Shemu 9. When taken at face value, the text of the Ebers calendar reports that the rising of Sothis occurred on III Shemu 9 in year 9 of Amenhotep I. Given that equivalents for pharaonic Sothic dates are subject to various conditions, the Ebers

Sothic date could correspond to any year between 1546 BC and 1503 BC (Chapter III. 10).

The Illahun archive contains a Sothic date and 21 lunar dates from the reigns of Senwosret III and Amenemhet III. The Sothic date is problematic since IV Peret 16 in year 7 of Senwosret III in the temple diary could be a mistake for IV Peret *18. When both possible dates, along with the uncertainties of pharaonic Sothic dates are considered, the Illahun Sothic date corresponds to any year between ca. 1882 and 1827 BC. By contrast, there is only one astronomically correct solution for the Illahun lunar dates, because lunar dates do not repeat regularly in 25 year cycles (Chapter III. 8). The result can be expressed as 1 Senwosret III = 1837/36 BC, corresponding to 1831/30 BC = year 7 of Senwosret III, the year of the recorded Sothic date.

Provided there was no calendar reform between year 7 of Senwosret III and year 9 of Amenhotep I, a maximum of 333 ± 3 years (Illahun Sothic date = IV peret 16) and a minimum of 325 ± 3 years (Illahun Sothic date = IV Peret *18) elapsed between the Illahun and Ebers Sothic dates. Subtraction of these figures from 7 Senwosret III = 1830 BC yields 1508 to 1494 BC, overlapping 1549 to 1503, the interval of the Ebers Sothic date. The overlap implies that the astronomically correct interval for the Ebers Sothic date is the period from 1508 to 1503 BC.

It follows from the Illahun lunar dates that 1 Amenemhet III = 1818/17 BC. The Nile level inscription referring to year 44 + x of Amenemhet III and year 1 of Amenemhet IV may indicate a coregency. The highest attested dates of Amenemhet IV and Nefrusobk, which compare favourably with the figures in the *TC*, yield ca. 1760 BC as last year of Dyn. 12. On this basis, year 3 of the immediate predecessor of Khendjer can be fixed, provided the Monthu feast recorded in pBoulaq 18 was celebrated on lunar day 2, like the Monthu feast that Luft recognized in the Illahun archive. If so, year 3 of Khendjer's predecessor, whether he was Sobekhotep II or not, was 1734 BC.

The Second Intermediate Period (Chapter II. 7)

The changes in the sequence of Second Intermediate Period kings and dynasties proposed by Ryholt are not necessarily compelling, and in any case, they have no chronological significance since dead reckoning

depends upon a fixed sequence of kings—and this does not exist. Rather, we must concentrate on dynasties. Ryholt's proposal of an overlap for Dyns. 12 and 13 is speculative; neither Ryholt nor Beckerath suggests that Dyn. 13 overlaps 15. By contrast, the concurrence of Dyn. 15 with 17 and 18 is certain.

There are very few contemporaneous dates for Dyn. 13: Ryholt (*Situation*, 193–194) lists less than two decades for Sobekotep I, Sonbef, Khendjer, and Sobekhotep IV, with another three decades documented for unknown rulers who should be assigned to this period. The remaining reigns must be assigned arbitrary dates based on averages, and references to Manetho or the *TC* which cannot be used to base an argument. Ryholt documents roughly half a century for Dyn. 13; he then extrapolates 154 years for all of Dyn. 13; Beckerath (*Untersuchungen*, 220) allotts only 133 years; Franke is closer to Beckerath, and Kitchen closer to Ryholt.

The overlap with Dyn. 18 can be estimated at less than two decades, with the conquest of Avaris not later than ca. year 18 of the reign of ʿAhmose, followed by the siege of Sharuhen before year 1 of Amenhotep I = 1514 BC. Based on attested dates, only year 33 of pRhind can be attributed to Dyn. 15. The stelae of Kamose provide some additional decades. Regardless of the paucity of contemporary sources, Dyn. 15 will have lasted more than a century, and Dyn. 13 at least 133 years. Thus the interval between the end of Dyn. 12 and the fall of Avaris would be $z = (x + 100) + (133 + y)$. This would place the end of Dyn. 12 before 1751 BC. The length of the Second Intermediate Period cannot be reduced further than the minimal figures provided here.

The Beginning of Dyn. XII

In Chapter II. 7, Schneider accepts, as have others, Jansen-Winkeln's arguments in favour of coregencies. Moreover, double-dating implies that coregencies have chronological consequences. But arguments in favour of coregencies are not compelling and if they existed in practice, there is no reason to presume they played a chronological role. The Illahun papyrus Berlin 10055 states that year 19 of [Senwosret III] was followed by year 1 of [Amenemhet III], while the Korosko-inscription implies that year 29 of Amenemhet I was valid as a date. If there were coregencies, possibly the 30-reign of Amenemhet I was followed by a 45–year reign of Senwosret I, whereas year 19 of Senwosret

III was followed by the 46–year reign of Amenemhet III. This has chronological implications since the Illahun lunar dates suggest that 1818/17 BC was the year of the accession of Amenenhat III, and this is the latest date compatible with our dead-reckoning for Dyns. 13 and 15, thus constituting the link between the length of the Second Intermediate Period and the Sothic dates for Senwosret III (year 7 = 1830 BC) and Amenhotep I (year 9 = 1508–1503 BC). We thus project back the dates for the earlier part of Dyn. 12, based on dead-reckoning, to arrive at year 1 of Amenemhet I as either ca. 1939/40 (with possible 16 years of coregencies) or ca. 1955/56 (without coregencies).

From the Early Middle Kingdom Back to Early Dyn. 11

The highest attested dates for Dyn. 11 add up to 106 years. Arguably the highest attested dates are not last regnal years; furthermore, no contemporaneous dates exist for three kings. The *TC* gives a total of 143 years for Dyn. 11 which seems to be of correct magnitude, but might be incorrect in detail. If the uncertainties of MK coregencies are considered, dead reckoning implies a date for the beginning of Dyn. 11 *well before* 2046 (with MK coregencies) or 2062 BC (no MK coregencies).

These limits must be reconciled with the Khozam lunar date of a regnal year [1] from the last years of Herakleopolitan hegemony in the Coptite nome, corresponding to the early years of Dyn. 11. Astronomically possible years for the Khozam lunar date are 2053, 2078, and 2103 BC. 2053 BC would appear to be too low, making it likely that Dyn. 11 began *shortly before* 2078 or 2103 BC.

From Early Dyn. 11 Back to Late Dyn. 5

For the First Intermediate Period we rely on the judicious estimate of Hayes and Fischer of not more than 40 years for the pre-Theban period, and we follow Baud in allowing Dyn. 8 to span a "generation" or about 30 years (Chapter II. 5).

Only 10 *m-ḫt zp* years and 12 *zp* years are documented for Dyn. 6. At least 72 *zp* years actually elapsed, i.e. 83.3% of the *zp* years are missing from the archaeological record. Presuming that the percentage of missing *m-ḫt zp* years is the same as for *zp* years, it is likely that at

most 60% of the regnal years of Dyn. 6 were *zp* years and at least ca. 40% (*m-*)*ẖt zp* years. Thus Dyn. 6 lasted between 120 and 144 years. Conversely, one can argue that the autobiography of Weni mandates that he served in a minor capacity during the reign of Teti, entering royal service under Pepy I, and continuing to serve energetically well into the reign of Merenreʿ. Since the highest known date for Pepy II would be *m-ẖt zp* 31, one can assume at least 63 years for that reign, and less than a century for those preceding.

By adding the minimum figures for the Second Intermediate Period and Dyns. 6 and 8 to ca. 2078/2103 BC for the very early years of Dyn. 11, we arrive at ca. 2268/2292 BC and 2293/2317 BC for year 1 of Dyn. 6 *at the latest.*

Posener-Kriéger found two lunar dates in the Neferirkareʿ archive; both could be regnal years of Izezi, or only one date his and the other Wenis's. We follow Posener-Kriéger who preferred the latter alternative, ascribing one lunar date to regnal year 7 of Wenis and the other to a regnal year of Izezi that lay 11 or 25 years earlier. It is generally agreed that the *TC*'s 30 years, and Manetho's 33 years for Onnos (Wenis) are far too high. The highest attested date of Wenis is *zp* 8, corresponding, at most, to regnal year 16. Provided the count was biennial, then 7 Wenis is at least (or exactly) 10 years earlier than the beginning of Dyn. 6, corresponding to ca. 2278/2302 BC or 2303/2327 BC, with 200/224 or 225/249 years thus lying between 7 Wenis and 2078, or 2089, or 2103 BC as year of the Khozam lunar date. Within this minimum range the appropriate lunar distance between year 7 of Wenis and the Khozam date amounts to at least 211 years + 119 days; other astronomically feasible possibilities are 236 y + 119 d or 261 y + 119 d. The corresponding possibilities for year 1 of Wenis can be expressed as 2321 BC ± 25 years. Taking into account that 2321 BC—25 years presupposes minimum figures for Dyn. 6, the preferable figure for year 1 of Wenis is 2321 BC or 2321 BC + 25 years.

Izezi ruled at least 33 years, provided 68% of his *m-ẖt zp* years are missing, as in the case of his *zp* years. If the count was regular, the reign lasted for at least 42, or 44 years, depending on the reading of the highest *zp* year; the year of his accession would be 2365/64 BC or 2365/64 BC + 25 years. Manetho's 44 years for Tancheres (< Djedkareʿ) would be correct, if only coincidentally, whereas the *TC*'s 28 years are inacceptable regardless.

Early and Mid-Dyn. 5

There are equal numbers of contemporaneous *zp* and *m-ḫt zp* years for Userkaf and Sahureʿ, implying a regular biennial count. For these kings the Royal Annals confirm a biennial count, whether the reconstruction of the stone's verso is exact or only approximate. The Annals should be chronographically reliable at least for early Dyn. 5, since the original presentation of the data (i.e., even if the Palermo stone itself is a copy) must have followed shortly after the actual compilation of the data, towards the end of the dynasty. The reconstructed Annals imply 8 year compartments for Userkaf, corresponding to at least 7 full regnal years. Sahureʿ, who reigned into *m-ḫt zp* 6, evidently occupied the throne for 6 *zp* years, 6 *m-ḫt zp* years, and a year *zmꜣ-tꜣwj*, altogether ca. 13 years.

For Neferirkareʿ *rnpt zp* 5 is the only securely attested contemporaneous date, whereas the Annals record the year *zmꜣ-tꜣwj* and the year after the 5th count. The count was evidently biennial, although the first count might have occurred only in the second full calendar year of the reign. Neferirkareʿ did not complete his funerary complex which suggests a shorter reign than that of Sahureʿ; we follow Verner in assigning him not more than 11 years. On the basis of discoveries at Abusir, Verner attributed 2 years at most to Raʿneferef, and identified Shepseskareʿ as his probable successor who ruled for only a fraction of a year. The few secure dates for Neuserreʿ, taken together with his building achievements, allow an estimate of at least 15 years, but possibly we err by a decade in attributing about 30 years to him. There are no contemporaneous dates for Menkauhor; on the basis of his archaeological record, it seems that his reign was not brief. The *TC* and Manetho possibly share the same tradition, the *TC* rounding to full 8 years, Manetho to a full 9. In conformity with common practice and fully aware of the risk, we attribute 8 full years to Menkauhor. If an uncertainty of ± 5 years is allowed for Neuserreʿ, we arrive at ca. 2440 BC ± 5 years or 2465 BC ± 5 years for year 1 of Userkaf.

End of Dyn. 4 and Row 1, Verso of the Annals Stone

For Shepseskaf, *rnpt m-ḫt zp jpt* 1 is attested; the Annals record his *rnpt zmꜣ tꜣwy*. According to Beckerath's recent reconstruction, row 1 on the verso contained 5 or 6 year compartments. These ca. 6 regnal years

at most can be allowed for Shepseskaf alone or for him and Thamphthis combined, if the latter existed. The *TC* with 4 + 2 years for the two rulers before [*Wsr-*]*kꜣ*-[*rꜥ*] does not contradict this arrangement.

There are no securely attested contemporaneous dates for Mycerinus. The amount of work that would have been required to complete his funerary complex as planned, amounted to only a tenth of that required for those of Khufu or Khephren. The fact that the project was largely unfinished, indicates a short reign. Nevertheless, Beckerath's reconstruction of the Annals favours the *TC*'s *28 years for Mycerinus, over alternative *18; his proposal shows 10 year compartments in row 1 on the verso, and he postulates 19 more above in a row "0". However, if the compartments in row 1 were of uniform width, then about 6 compartments result for Mycerinus. A short reign of ca. 6 years is compatible with the archaeological record. Coincidentally Herodotus appears to report a reign of 6 years for Mycerinus.

The remainder of Dyn. 4.—The masons' marks from the Giza necropolis documenting *rnpt zp* 4 through 13 can be attributed to Khephren and Cheops. These record only *zp* years, presumably a shortened notation that dispensed with references to *m-ḫt zp* years. In view of Khephren's considerable building activity, it is to be expected that he ruled more than 20 years, corresponding to the *TC*'s 20 + × years.

The *TC* and Manetho seem to concur in placing Bikheris after Khephren. Regardless, the king who excavated the Great Pit at Zawyet el-Aryan was more likely the successor of Raꜥdjedef than Khephren's. Analysis of the pyramid's architecture reveals similarities to Raꜥdjedef's monument as planned; the discovery of a palette with Raꜥdjedef's name at the site likewise supports the contention. The reign must have been short; Manetho's 22 years can be tentatively explained as inflated from an original *2 years; the figure in the *TC* is lost. For Raꜥdjedef, *rnpt zp* 1 is attested; the *TC*'s 8 years are compatible with his building achievement.

The masons' marks indicate a reign of more than 20 years for Cheops, again commensurate with his enormous building activity. An expedition graffito attests *rnpt m-ḫt zp* 13, corresponding to regnal year 27, provided the count was biennial, and contradicting the 23 years in the *TC*. Manetho's 63 or 66 years for Suphis (Cheops) could be secondarily influenced by Herodotus's 50 years for Cheops and 56 for Khephren, but could have originated in *23 or *26 (or *33 or *36) years.

The highest attested date for Snofru is *zp* 24, corresponding to ca. year 48, presuming again a biennial count. However, graffiti from the

Maidum pyramid site indicate that the count was irregular, and this is confirmed by the Annals that record the 7th and 8th count without an intervening year. The construction of three pyramids, one at Maidum and two at Dahshur, could have been achieved within three decades.

Biographical data allow a limited check on these results. The life of Netjeripunisut extended from the reign of Raʿdjedef through Sahureʿ; Sekhemreʿ lived under Khephren through Sahureʿ, and Ptahshepses under Mycerinus to Neuserreʿ. Thus the overall length of our relative chronology seems correct. But since each of these men may have lived for 50, 60 or even 70 years, further refinement cannot be expected. Thus we arrive at ca. 2548 BC ± 5 years or 2573 BC ± 5 years for the beginning of Dyn. 4.

Dyns. 1–3

The contemporaneous dates available today do not suffice to establish a coherent chronology for Dyns. 1–3. Furthermore, the history of the second half of Dyn. 2 is unclear, insofar as kings might have ruled simultaneously and not successively. Thus we are dependent on the fragments of the Annals stone (Chapter I. 1). The uncertainty inherent in utilizing them is twofold: the dates are not contemporaneous with the stone and any reconstruction of the fragments will contain mistakes. By correcting the errors of recent attempts, we arrive at a total of 355 years for Dyns. 1–3. This implies that the first year compartment of the Annals corresponded to ca. 2900 BC or 2925 BC, be this a year of ʿAha or Naʿrmer.

The range of the C-14 dates for Abydos tomb U-j imply that it was probably roughly contemporary with the tomb of ʿAha (Görsdorf et al., "Results", 173), which it must have preceded. The archaeological material likewise confirms that Naqada IIc–d cannot have been significantly earlier than Naqada IIIa (Braun & van den Brink, "Comments"), as indicated by the C-14 dates from Abydos U-224, U-287, which means that Naqada IId almost overlaps with Naqada IIIa2. The archaeological material suggests that Naqada IIIa swiftly followed on Naqada IId and from the C-14 samples, it follows that Naqada IIIa was quickly succeeded by Dyn. 1. As Braun and van den Brink note, the time elapsed from final Naqada IId to early Dyn. 1 cannot have been significantly more than a century.

For absolute dating, the C-14 method can only offer a limited degree of precision. The C-14 dates for Uruk and Abydos demonstrate that the median dates for the relevant levels of the Late Uruk Temple C at Uruk (± 3450 cal. BC) were invariably more than two centuries older than those for Naqada IIIa2 and Dyn. 1 (ca. 3200 BC: Boehmer et al. "Datierungen"). The relative position of Late Uruk centuries before the end of the Predynastic sequence must be valid, but precise dates for the end of the Predynastic cannot be taken at face value. As published, these are impossible with the C-14 dates for Abydos Dyn. 1 tomb B-19 earlier than the Jemdet Nasr period (which should begin ca. 3100 BC: Porada et al., "Mesopotamia"), since the iconography of the palettes and sealings from the later Predynastic and earliest Dynastic Periods cannot antedate the Jemder Nasr period; in fact, Boehmer (1991: 60) argues that Naqada IIIa2 = Late Jemder Nasr, and thus the Abydos Naqada IIIa2 tomb U-j should be dated to around or after 3000 BC. Either the Mesopotamian chronology must be revised, or the end of Naqada IIIa and the beginning of Dyn. 1 must be assigned a date ca. 3000 or 2950 BC.

Dreyer's reconstruction of a seal from impressions recovered from the tomb of Qa-ʿa listing all kings of Dyn. 1, should leave no doubt that Nar-mer was viewed by the Egyptians as the first king of Dyn. 1; and thus his reign will have begun the dynastic period around 2950 BC (Dreyer et al., "Umm el-Qaab", 77–167).

Postscript by Stan Hendrickx

When this chapter was in press, Christiana Köhler published an article of great importance for the relative chronology of the Naqada III period, based on her excavations at Helwan.[1] Helwan is by far the largest Naqada III cemetery and offers great possibilities for chronological studies. This is especially relevant for the Naqada IIID period, which at

[1] E. C. Köhler, "On the origins of Memphis—The new excavations in the Early Dynastic necropolis at Helwan", in: S. Hendrickx, R. F. Friedman, K. M. Cialowicz & M. Chlodnicki (eds.), *Egypt at its Origins. Studies in Memory of Barbara Adams. Proceedings of the International Conference "Origin of the State. Predynastic and Early Dynastic Egypt", Krakow, 28th August–1st September 2002* (Leuven-Paris-Dudley: OLA 138, 2004), 295–315.

present has only been rather vaguely defined. Köhler proposes an additional phase for the Naqada III period, Naqada IIIC3, and a triple subdivision of Naqada IIID, *i.e.*, IIID1–IIID3, after Helwan tomb groups distinguished according to the presence and absence of diagnostic finds such as cylindrical vessels, "wine jars" and "beer jars" with their respective typological sequence.[2] Naqada IIIC3 would encompass the reigns of Qa-ʿa and Semerk-het, the last two kings of 1st dynasty, and be characterised by very late and rudimentary variants of the cylindrical jars. Eventually, Naqada IIIC3 might continue into the 2nd dynasty. Cylindrical jars no longer occur during the Naqada IIID period, while there are also changes in tomb architecture. During Naqada IIID1, the "wine jars" become more elongated in shape and early "beer jars" occur at the same time. Naqada IIID2 is not well defined and could be contemporaneous with IIID1, from which it mainly differs through the architecture of the tombs. During Naqada IIID3, a new type of "beer jars", with direct rim, occurs together with the old type with shoulder and lip rim. Another important characteristic are the earliest examples of bowls with internal rim, that will become one of the main characteristics of the early OK. Naqada IIID3 as defined by Köhler dates to the end of the 2nd dynasty and is to be compared with the late 2nd dynasty assemblage from Elephantine.[3] As is stressed by Köhler herself, the distinction between the groups and their sequence is only preliminary and will have to be confirmed or adapted following further excavations.

Résumé

The chronology presented here is predicated on historical methodology. It agrees with Beckerath and Kitchen on 1279 and 1479 BC as the accession years of Ramesses II and Thutmose III. A noteworthy discrepancy is our acceptance of 19 years for Psusennes II which reduces the gap in absolute chronology between Dyns. 21 and 20.

For the Middle Kingdom, the difference between our figures and those of Beckerath and Kitchen in particular amounts to three and a

[2] Köhler (n. 2), 299–306.

[3] D. Raue, 'Ägyptische und nubische Keramik der 1.–4. Dynastie', in: W. Kaiser et al., "Stadt und Tempel von Elephantine 25./26./27. Grabungsbericht", *MDAIK 55* (1999), 180–182.

half decades; the discrepancy results from our consistent exploitation of two different kinds of astronomical data, lunar and Sothic. There are further cases of widely differing regnal year figures in the Old Kingdom; compare, for example, our allocation of 2 years for Raʿneferef and Shepseskareʿ combined, to Beckerath's 18 and Kitchen's 14 years. Another example is our attribution of 6 years to Mycerinus, as compared to 28 years in Beckerath's chronology and Kitchen's 18. In view of the uncertainties in any reconstruction of the Annals, the discrepancies for Dyns. 1 to 3 should not be stressed. However, both the typological analysis and the comparative material from Mesopotamia do not leave much leeway for significant changes.

A problem that appears to be resolvable concerns the absolute dates for the Middle Kingdom or, formulated differently, the duration of the Second Intermediate Period. When Borchardt presented the newly discovered Illahun Sothic date in 1899, he wrote (*ZÄS* 37, 1899, 102):

> Es ist also das 7. Jahr Usertesen's III in die Jahre von 1876–1873 v. Chr. anzusetzen, d.h. immer noch etwa 100 Jahre später als es der am niedrigsten greifende Historiker Ägyptens, Eduard Meyer, in seinen Minimaldaten annahm. Es bleiben uns also für die Zeit zwischen Usertesen III und Amenophis I, dessen 9. Jahr durch die Sothisangabe des Papyrus Ebers auf die Jahre 1545–1542 v. Chr. bestimmt ist, nur rund 330 Jahre und für die Zeit vom Ende der 12. bis zum Anfang Dynastie gar nur 200 bis 210 Jahre übrig. Ist das mit den sonst bekannten historischen Angaben vereinbar?

Borchardt answered his own rhetorical question in the affirmative, but decades later, when Gardiner commented in Excursus C of his *Grammar* on the Sothic dates of Thutmose III, Amenhotep I (year 9) and Senwosret III (year 7), he wrote that "the first two dates fit admirably with other considerations, but the third has been thought by some to allow too small an interval between the Twelfth and the Eighteenth Dynasty."

Today several Egyptologists contend that Borchardt's interval is too short. By contrast, we share Borchardt's opinion and adduce further arguments in its favour. Although our absolute dates for Senwosret III and Amenhotep I are lower than Borchardt's, the relative distance between 7 Senwosret III and 9 Amenhotep I remains more or less the same. Whereas Borchardt had only the Sothic dates to compute the distance between Senwosret III and Amenhotep I, we also utilize the Illahun lunar dates. The only astronomically workable distance between year 7 of Senwosret III and 9 of Amenhotep I is 324 years—regardless of whether those who think this interval too short like it or not.

IV. 2 CHRONOLOGICAL TABLE FOR THE DYNASTIC PERIOD

The selection of names and their transcription follows the lead of Baines & Malek, *Atlas*, 36–37 for the most part except in those cases where authors insisted on their own alternatives. Throne names are rendered in *italics*. For the Early Dynastic Period chronology is based on the Annals stone (Chapter I. 1); for the period between ca. 2350 and 750 BC on lunar dates (Chapter III. 8), and therefore differs slightly in some cases from the information found in the chapters on relative chronology.

Early Dynastic Period	**ca.**	**2900–2545**$^{+25}$
Dyn. 1	**ca.**	**2900–2730**$^{+25}$
Nar-mer	ca.	2900–?$^{+25}$
ʿAha		?–2870^{+25}
Djer		2870–2823^{+25}
"Serpent"		2822–2815^{+25}
Den		2814–2772^{+25}
ʿAdj-ib/Anedjib		2771–2764^{+25}
Semer-khet		2763–2756^{+25}
Qa-ʿa		2755–2732^{+25}
Dyn. 2	**ca.**	**2730–2590**$^{+25}$
Hetep-sekhemwy		2730–?$^{+25}$
Raʿ-neb		?–2700^{+25}
Ny-netjer		2700–2660^{+25}
Per-ibsen		2660–2650^{+25}
Sekhem-ib		2650–?$^{+25}$
Sened		?–2610^{+25}
Kha-sekhemwy		2610–2593^{+25}
Dyn. 3	ca.	2592–2544^{+25}
Djoser (Netjery-khet)		2592–2566^{+25}
Sekhem-khet		2565–2559^{+25}
Khaʿba		2559–?$^{+25}$
Nebka		?–?$^{+25}$
Huni		?–2544^{+25}
Old Kingdom	**ca.**	**2543–2120**$^{+25}$
Dyn. 4	**ca.**	**2543–2436**$^{+25}$
Snofru		2543–2510^{+25}

(*continued on next page*)

Table (*cont.*)

Khufu (Cheops)		2509–2483^{+25}
Raʿdjedef/Djedefreʿ		2482–2475^{+25}
Bikheris		2474–2473^{+25}
Khephren (Raʿkhaʿef)		2472–2448^{+25}
Menkaureʿ (Mycerinus)		2447–2442^{+25}
Shepseskaf		2441–2436^{+25}
Dyn. 5	**ca.**	**2435–2306**$^{+25}$
Userkaf		2435–2429^{+25}
Sahureʿ		2428–2416^{+25}
Neferirkareʿ Kakai		2415–2405^{+25}
Raʿneferef/Neferefreʿ		2404^{+25}
Shepseskareʿ Izi		2403^{+25}
Neuserreʿ Ini		2402–2374^{+25}
Menkauhor		2373–2366^{+25}
Djedkareʿ Izezi		2365–2322^{+25}
Wenis		2321–2306^{+25}
Dyn. 6	**ca.**	**2305–2118**$^{+25}$
Teti		2305–2279^{+25}
Userkareʿ		?–?$^{+25}$
Pepy I *Meryreʿ*		2276–2228^{+25}
Nemtyemzaef *Merenreʿ*	ca.	2227–2217^{+25}
Pepy II *Neferkareʿ*		2216–2153^{+25}
Nemtyemzaef II		2152^{+25}
Dyn. 8	**ca.**	**2150–2118**$^{+25}$
Neferkaureʿ		2126–2113^{+25}
Neferkauhor		2122–2120^{+25}
Neferirkareʿ		2119–2218^{+25}
First Intermediate Period	**ca.**	**2118–1980**$^{+25}$
(Herakleopolitan) Dyns. 9 and 10	**ca.**	**2118–1980**$^{+25}$
Middle Kingdom	**ca.**	**1980**$^{+16}$**–1760**
(Theban) Dyn. 11	**ca.**	**2080–1940**$^{+16}$
Mentuhotep I (Tepiʿa)	ca.	1980–?$^{+16}$
Inyotef I (Sehertawy)	ca.	?–2067^{+16}
Inyotef II (Wahʿankh)		2066–2017^{+16}
Inyotef III (Nakhtnebtepnufer)		2016–2009^{+16}
Mentuhotep II *Nebhepetreʿ*		2009–1959^{+16}
Mentuhotep III *Sʿankhkareʿ*		1958–1947^{+16}
Mentuhotep IV *Nebtawyreʿ*		1947–1940^{+16}
Dyn. 12		**1939**$^{+16}$**–1760**
Amenemhet I *Sehetepibreʿ*		1939–1910^{+16}
Senwosret I *Kheperkareʿ*		1920–1875^{+6}
Amenemhet II *Nebukaureʿ*		1878–1843^{+3}

(*continued on next page*)

Table (*cont.*)

Senwosret II *Khaʿkheperreʿ*		1845–1837
Senwosret III *Khaʿkaureʿ*		1837–1819
Amenemhet III *Nimaʿatreʿ*		1818–1773
Amenemhet IV *Maʿkherureʿ*		1772–1764
Nefrusobk *Sebekkareʿ*		1763–1760
Second Intermediate Period		**1759–ca. 1539**
Dyn. 13		**1759–ca. 1630**
Wegaf *Khutawyreʿ*		1759–1757
Amenemhet VII *Sedjefakareʿ*	ca.	1753–1748
Sobekhotep II *Sekhemreʿ-khutawy*		1737–1733
Khendjer *Userkareʿ*	ca.	1732–1728
Sobekhotep III *Sekhemreʿ-swadjtawy*	ca.	1725–1722
Neferhotep I *Khaʿsekhemreʿ*	ca.	1721–1710
Sobekhotep IV Khaʿneferreʿ	ca.	1709–1701
Sobekhotep V *Khahotepreʿ*	ca.	1700–1695
Ibiau *Wahibreʿ*	ca.	1695–1685
Aya *Merneferreʿ*	ca.	1684–1661
Ini *Merhetepreʿ*	ca.	1660–1659
Swadjtu, Ined, Hori, Dedumose		
Dyn. 14		**?**
Dyn. 15 (Hyksos)	**ca.**	**?–ca. 1530**
Khian *Swoserenreʿ*		
Apophis *ʿAwoserreʿ*	ca.	1575–1540
Khamudi		
Dyns. 16 and 17	**ca.**	**?–1540**
Sobekhotep VIII, Nebiriau, Rahotep, Sobekemzaf I & II, Bebiankh		
Inyotef *Nebukheperreʿ*		?–?
Taʿo *Senakthenreʿ*		?–?
Taʿo *Seqenenreʿ*		?–?
Kamose *Wadjkheperreʿ*	ca.	?–1540
New Kingdom	**ca.**	**1539–1077**
Dyn. 18	**ca.**	**1539–1292**
ʿAhmose *Nebpehtireʿ*	ca.	1539–1515
Amenhotep I *Djeserkareʿ*		1514–1494
Thutmose I *ʿAkheperkareʿ*		1493–1483
Thutmose II *ʿAkheperenreʿ*		1482–1480
Thutmose III *Menkheperreʿ*		1479–1425
Hatshepsut *Maʿatkareʿ*		1479–1458
Amenhotep II *ʿAkheperureʿ*		1425–1400
Thutmose IV *Menkheprureʿ*		1400–1390
Amenhotep III *Nebmaʿatreʿ*		1390–1353
Amenhotep IV/Akhenaten *Neferkheprureʿ*		1353–1336

(*continued on next page*)

Table (*cont.*)

Smenkhkareʿ/Nefernefruaten *ʿAnkhkheprureʿ*		1336–1334
Nefernefruaten *ʿAnkhetkheprureʿ*		1334–?
Tutʿankhaten/amun *Nebkheprureʿ*		?–1324
Itnetjer Aya *Kheperkheprureʿ*		1323–1320
Haremhab *Djeserkheprureʿ*		1319–1292
Dyn. 19		**1292–1191**
Ramesses I *Nebpehtireʿ*		1292–1291
Sety I *Menmaʿatreʿ*		1290–1279
Ramesses II *Usermaʿatreʿ setepenreʿ*		1279–1213
Merneptah *Baenreʿ*		1213–1203
Sety II *Userkheprureʿ*		1202–1198
Amenmesses *Menmireʿ*		1202–1200
Siptah *Akhenreʿ*		1197–1193
Towsre *Sitreʿ meritamun*		1192–1191
Dyn. 20		**1190–1077**
Sethnakhte *Userkhaʿureʿ*		1190–1188
Ramesses III *Usermaʿatreʿ meriamun*		1187–1157
Ramesses IV *Heqamaʿatreʿ setepenamun*		1156–1150
Ramesses V *Usermaʿatreʿ Sekheperenreʿ*		1149–1146
Ramesses VI *Nebmaʿatreʿ meryamun*		1145–1139
Ramesses VII *Usermaʿatreʿ setepenreʿ meryamun*		1138–1131
Ramesses VIII *Usermaʿatreʿ akhenamun*		1130
Ramesses IX *Neferkareʿ setepenreʿ*	ca.	1129–1111
Ramesses X *Khepermaʿatreʿ setepenreʿ*	ca.	1110–1107
Ramesses XI *Menmaʿatreʿ setepenptah*	ca.	1106–1077
Third Intermediate Period	**ca.**	**1076–723**
Dyn. 21	**ca.**	**1076–944**
Smendes *Hedjkheperreʿ setepenreʿ*	ca.	1076–1052
Psusennes I *ʿAkheperreʿ setepenamun*	ca.	1051–1006
Amenemnisut *Neferkareʿ*	ca.	1005–1002
Amenemope *Usermaʿatreʿ setepenamun*	ca.	1002–993
Osorkon *ʿAkheperreʿ setepenreʿ*		992–987
Siamun *Netjerkheperreʿ setepenamun*		986–ca. 968
Psusennes II *Titkheprureʿ*	ca.	967–944
Dyn. 22		**943–ca. 746**
Shoshenq I *Hedjkheperreʿ setepenreʿ*		943–923
Osorkon I *Sekhemkheperreʿsetepenreʿ*		922–ca. 888
Takelot I *Usermaʿatreʿ setepenamun*	ca.	887–874
Shoshenq II *Heqakheperreʿ setepenreʿ*	ca.	873
Osorkon II *Usermaʿatreʿ setepenamun*	ca.	872–842
Shoshenq III *Usermaʿatreʿ setepenreʿ/amun*		841–803
Shoshenq IIIa *Hedjkheperreʿ*		?–790

(*continued on next page*)

Table (*cont.*)

Pami *Userma'atre' setepenre'/amun*		789–784
Shoshenq V *'Akheperre'*		783–ca. 746
Dyn. 23 (UE) and Rival Kings		
Takelot II		845–821
Iuput I		820–809–
Osorkon III, Takelot III	ca.	780 ± 20
Petubaste I		834–812–
Shoshenq IV, Rudamun, Iny		
Dyn. 23 (LE)	**ca.**	**730**
Petubaste II (?), Osorkon IV		
Dyn. 24	**ca.**	**736–723**
Tefnakhte *Shepsesre'*	ca.	736–729
Bocchoris *Wahkare'*		728–723
Late Period	**ca.**	**722–332**
Dyn. 25	**ca.**	**722–ca. 655**
Piye/Pi'ankhy	ca.	753–723
Shabaka *Neferkare'*	ca.	722–707
Shebitku *Djedkaure'*	ca.	706–690
Taharqa *Khure'nefertem*		690–664
Tantamani *Bakare'*		664–ca. 655
Dyn. 26		**664–525**
Psammetichus I *Wahibre'*		664–610
Necho II *Wehemibre'*		610–595
Psammetichus II *Neferibre'*		595–589
Apries *Ha'aibre'*		589–570
Amasis *Khnemibre'*		570–526
Psammetichus III *'Ankhkaenre'*		526–525
Dyn. 27 (Persian)		**525–404**
Cambyses		525–522
Darius I		521–486
Xerxes		486–466
Artaxerxes I		465–424
Darius II		424–404
Dyn. 28		**404–399**
Amyrtaios		404–399
Dyn. 29		**399–380**
Nepherites *Baenre' merynetjeru*		399–393
Psammuthis *Userre' setepenptah*		393
Hakoris *Khnemma'atre'*		393–380
Nepherites II		380

(*continued on next page*)

Table (*cont.*)

Dyn. 30	**380–343**
Nectanebo I *Kheperkareʿ*	380–362
Teos *Irmaʿatenreʿ*	365–360
Nectanebo II *Senedjemibreʿ setepenanhur*	360–343
2nd Persian Period	**343–332**
Artaxerxes III Ochus	343–338
Arses	338–336
Darius III Codoman	335–332
Alexander the Great	**332–323**

IV. 3 KUSHITE RULERS OF PRE-25TH DYNASTY, 25TH DYNASTY, NAPATAN AND MEROITIC TIMES INCLUDING THEIR BURIALS AND PRESUMED DATES FOR REIGNS[1]

Generation	Name of Ruler	Burial[2]	Dates
Gen. A	Ruler A	Ku. Tum. 1	c. 885–835 BC[3]
Gen. B	Ruler B	Ku. Tum. 2	c. 865–825 BC
Gen. C	Ruler C	Ku. Tum. 6	c. 845–815 BC
Gen. D	Ruler D	Ku. 14	c. 825–805 BC
Gen. E	Ruler E	Ku. 11	c. 805–795 BC
Gen. F	Alara	(Ku. 9)	c. 785–765 BC
	Kings of Dyn. 25[4]		
Gen. 1	Kashta	(Ku. 8)	c. 765–753 BC
Gen. 2	Piankhi [Piye]	Ku. 17	c. 753–722 BC
Gen. 3	Shabaka [Shabaqo]	Ku. 15	c. 722–707 BC
Gen. 4	Shebitku	Ku. 18	c. 707–690 BC
Gen. 5	Taharqa [Taharqo]	Nu. 1	690–664 BC
Gen. 6	Tanwetamani	Ku. 16	664–655/53 BC (in Egypt)
	Napatan Kings		
Gen. 7	Atlanersa	(Nu. 20)	2nd half of 7th cent. BC[5]
Gen. 8	Senkamanisken	Nu. 3	2nd half of 7th cent. BC
Gen. 9	Anlamani	Nu. 6	late 7th cent. BC
Gen. 10	Aspalta	Nu. 8	early 6th cent. BC (campain Psammetik's II against Nubia in 593 BC)
Gen. 11	Aramatelqo	Nu. 9	2nd quarter of 6th cent. BC
Gen. 12	Malonaqen	Nu. 5	1st half of 6th cent. BC
Gen. 13	Analmakheye[6] [Analmaʿaye]	Nu. 18	middle of 6th cent. BC
Gen. 14	Amani-nataki-lebte	Nu. 10	2nd half of 6th cent. BC
Gen. 15	Karkamani	Nu. 7	2nd half of 6th cent. BC
Gen. 16	Amaniastabarqo	Nu. 2	late 6th cent. BC

(*continued on next page*)

[1] Questionable rulers in parentheses; alternative or conventional readings of names in brackets; completely hypothetical rulers excluded, e.g., Pisekara, who has been thought to have been king solely because he fathered a presumed king.

[2] Ascribed burials in parentheses, controversial burials excluded.

[3] Dates for Generations A–E after Kendall, *Meroitica* 15, 97.

[4] Calculations based on conventional dates, antedated using the Tang-i Var inscription.

[5] Napatan and Meroitic dates—except for the few fixed points—according to generally accepted hypothetical reign lengths.

[6] After Priese, *Sprachmaterial*, 105–106 (95).

Table (*cont.*)

Generation	Name of Ruler	Burial	Dates
Gen. 17	Sikhespiqo[7] [Siʿaspiqo]	Nu. 4	early 5th cent. BC
Gen. 18	Nasakhma	Nu. 19	1st half of 5th cent. BC
Gen. 19	Malowi-Amani [Malowiebamani]	Nu. 11	middle of 5th cent. BC
Gen. 20	Talakhamani	Nu. 16	2nd half of 5th cent. BC
Gen. 21	Arike-Amanote	Nu. 12	2nd half of 5th cent. BC
Gen. 22	Baskakeren	Nu. 17	late 5th cent. BC
Gen. 23	Harsijotef	Nu. 13	early 4th cent. BC
Gen. 24	King, name unknown	Ku. 1	middle of 4th cent. BC
Gen. 25	Akhratan	Nu. 14	2nd half of 4th cent. BC
Gen. 26	Amanibakhi	?	2nd half of 4th cent. BC
Gen. 27	Nastasen	Nu. 15	last 3rd of 4th cent. BC
Gen. 28–32	**Neo-Ramesside Rulers**		late 4th cent. to 2nd third of 3rd cent. BC
	Aktisanes [*Gtsn*]	(Bar. 11)	
	Ary(amani)	(Bar. 14)	
	Kash . . . amani	(Bar. 15)	
	Arike-Pi(ankhi)-qo	?	
	Sabrakamani	?	
	Meroitic Kings and ruling Queens[8]		
Gen. 33	*Arkamanis[9] [Ergamenes I., Arqamani-qo, Arakakamani]	Beg. S. 6	2nd quarter of 3rd cent. BC
Gen. 34	*Amanisaraw[10] [Amanislo]	Beg. S. 5	
Gen. 35	*Amani-tekha	Beg. N. 4	
Gen. 36	*Arnekhamani	(Beg. N. 53)	last 3rd of 3rd cent. BC
Gen. 37	*Arqamani [Ergamenes II]	Beg. N. 7	end of 3rd cent. BC
Gen. 38	*Tabirqo [Adikhalamani ?]	Beg. N. 9	1st third of 2nd cent. BC
Gen. 39	King, name unknown	Beg. N. 10	
Gen. 40	King, name unknown	Beg. N. 8	
Gen. 41	Königin Sanakadakhete	(Beg. N. 11)	2nd half of 2nd cent. BC
Gen. 41	King, name unknown	Beg. N. 12	
Gen. 43	*Naqyrinsan	(Beg. N. 13)	
Gen. 44	Taneyidamani	(Beg. N. 20)	early 1st cent. BC
Gen. 45	King, name unknown	Bar. 2	
Gen. 46	Queen, name unknown	Bar. 4	
Gen. 47	Queen Nawidemaka	Bar. 6	

(*continued on next page*)

[7] After Hintze, *Fs Dunham*, 93.

[8] Asterisks designate Meroitic kings whose names are known only in Egyptian hieroglyphic transcriptions.

[9] Improved reading after Hallof, *International Conferenc for Meroitic Studies*, 2004, Paris, in press.

[10] According to the improved reading Amanisaraw (see note 9), the name could possibly be understood as Meroitic Amani-Sedewa or Amani-Salawa.

Table (*cont.*)

Generation	Name of Ruler	Burial	Dates
Gen. 48	Amanikhabale	(Beg. N. 2)	
Gen. 49	Teriteqase	(Beg. N. 14)	last 3rd of 1st cent. BC
Gen. 50	Queen Amanirenase	(Beg. N. 21)	late 1st cent. BC
Gen. 51	Queen Amanisakheto	Beg. N. 6	
Gen. 52	Natakamani	Beg. N. 22	2nd half of 1st cent. AD
Gen. 53	(Sorakarora)	?	
Gen. ?	(Amanitaraqide)	(Beg. N. 16)	
Gen. ?	Amanikhareqerema	?	end of 1st cent. AD[11]
Gen. ?	Amanitenamomide	Beg. N. 17	2nd half/end of 1st cent. AD
Gen. ?	Queen *Amanikhatashan	Beg. N. 18	to middle of 2nd cent. AD
Gen. ?	Tarekeniwala	Beg. N. 19	
Gen. ?	Ariteneyesebokhe	Beg. N. 34[12]	
Gen. ?	Takideamani	(Beg. N. 29)	
Gen. ?	(Arayesebokhe)	(Beg. N. 36)	
Gen. ?	Teqorideamani	Beg. N. 28	accession 248/249 AD
Gen. ?	(Tamelordeamani)	?	
Gen. ?	Yesebokheamani	?	end of 3rd cent. AD
Gen. ?	Queen, name unknown	Beg. N. 26	
Gen. ?	Queen, name unknown	Beg. N. 25	End of kingdom, about 330–370 AD
	Known rulers not sequenced		
Gen. ?	Karaki[13]	?	
Gen. ?	*Šsp-ʿnḫ-n-Jmn stp.n Rʿ*[14]	?	
Gen. ?	Aqrakamani[15]	?	
	Burials in Beg. N. not ascribed or sequenced in table		
Gen. ?		Beg. N. 41	
Gen. ?		Beg. N. 30	
Gen. ?		Beg. N. 38	
Gen. ?		Beg. N. 51	
Gen. ?		Beg. N. 24	
Gen. ?		Beg. N. 27	

[11] According to Wenig, *Meroitica* 15, 681, he should be dated close to Taneyidamani, since *nswt-bjt* occurs in the king's title. However, cf. Naqa, Inschr. 18. 21, where  is used as title (Török, *FHN* III, 937–38).

[12] This formally disputed location of burial is now ascertained (Hinkel, *Suppl. BIFAO* 81 (Bulletin du Centenaire), 1981, 379–88.

[13] A king Karaki to be listed before Sabrakamani is mentioned in Beg. S. 10. See Macadam, Kawa I, 74 (Inscr. XIII); Hallof, *International Conference for Meroitic Studies*, 2004, Paris, in press.

[14] Early Ptolemaic; see FHN II, 571 f. (118. 119); for the epithet *stp.n Rʿ* see Jansen-Winkeln, BSEG 23, 1999, 51–61, esp. 54.

[15] FHN II, 686 (161): about 29–25 BC; Burckhardt, Meroitica 8, 1985, 76 and note 12: late 1st to early 2nd cent. AD.

ABBREVIATIONS AND BIBLIOGRAPHY

LIST OF ABBREVIATIONS

Cf. also the abbreviations in *Lexikon der Ägyptologie* VII (1992), XIII–XXXVIII

AD	Anno Domini
BC	Before Christ
BP	Before present
Dak.	Dakke
FIP	First Intermediate Period
Fs	Festschrift
HP	High Priest
HPA	High Priest of Amun
LD	Lunar Day
LE	Lower Egypt
LM	Lunar month
LN	Lower Nubia
LP	Late Period
MK	Middle Kingdom
NK	New Kingdom
OK	Old Kingdom
Ph.	Philae
SIP	Second Intermediate Period
TC	Turin Canon
TIP	Third Intermediate Period
TL	Thermoluminescence
TT	Theban Tomb
UE	Upper Egypt
WB	Wörterbuch

Periodicals and Series

AAR	African Archaeological Review
ÄA	Ägyptologische Abhandlungen
ÄAT	Ägypten und Altes Testament
ÄgFo	Ägyptologische Forschungen
AfO	Archiv für Orientforschung
AH	Aegyptiaca Helvetica
AHw	Akkadisches Handwörterbuch
Ä&L	Ägypten und Levante
AnBib	Analecta Biblica
ANM	Archéologie du Nil Moyen
ANRW	Aufstieg und Niedergang des Römischen Reiches, W. Haase, ed.
AJA	American Journal of Archaeology
AJSL	American Journal of Semitic Languages and Literatures
AoF	Altorientalische Forschungen
APAW	Abhandlungen der Preussischen Akademie der Wissenschaften
APF	Archiv für Papyrusforschung und verwandte Gebiete
ASAE	Annales du Service des Antiquités de l'Égypte

AV	Archäologische Veröffentlichungen des DAI
BÄBA	Beiträge zur ägyptischen Bauforschung und Altertumskunde
BAR	Breasted, Ancient Records
BCE	Bulletin de liaison du groupe international d'étude de la céramique égyptienne
BdE	Bibliothèque d'Études
BIFAO	Bulletin de l'Institut français d'archéologie orientale
BiAe	Bibliotheca Aegyptiaca
BiOr	Bibliotheca orientalis
BS	Bollingen Series
BMFA	Bulletin of the Museum of Fine Art
BSFFT	Bulletin de la Société Française des Fouilles de Tanis
BzS	Beiträge zur Sudanforschung
CAA	Corpus Antiquitatum Aegyptiacarum
CAH	The Cambridge Ancient History
CdE	Chronique d'Égypte
CG	Catalogue Général des Antiquités Égyptiennes du Musée du Caire
CRAIBL	Comptes rendus de l'Académie des Inscriptions et Belles-lettres
CRIPEL	Cahiers de Recherches de l'Institut de Papyrologie et d'Égyptologie de Lille
CSSM	Malinine, Catalogue des stèles du Sérapeum
DE	Discussions in Egyptology
EAT	Neugebauer & Parker, Egyptian Astronomical Texts
FHN	Eide, Fontes Historiae Nubiorum
Gifts	Friedman, Gifts
GLR	Gauthier, Livre des rois
GM	Göttinger Miszellen
GOF	Göttinger Orientforschungen
GRL	Geophysical Research Letters
HAS	Harvard African Studies
HPBM	Hieratic Papyri in the British Museum
HESPOK	Smith, History
HO	Cerný, Hieratic Ostraca
JACF	Journal of the Ancient Chronology Forum
JAnAr	Journal of Anthropological Archaeology
JARCE	Journal of the American Research Center in Egypt
JAS	Journal of Archaeological Science
JCS	Journal of Cuneiform Studies
JEA	Journal of Egyptian Archaeology
JEOL	Jaarbericht van het Vooraziatisch-Egyptisch Genootschaap Ex Oriente Lux
JHA	Journal for the History of Astronomy
JNES	Journal of Near Eastern Studies
JRAI	Journal of the Royal Anthropological Institute
JSSEA	Journal of the Society for the Study of Egyptian Antiquities
Kawa	Macadam, Kawa
KRI	Kitchen, Ramesside Inscriptions
LD	Lepsius, Denkmäler
LD Text	Lepsius, Denkmäler Text
LEM	Caminos, Late Egyptian Miscellanies
LRL	Wente, Late Ramesside Letters
MDAIK	Mitteilungen des Deutschen Archäologischen Instituts Abteilung Kairo
MAe	Monumenta Aegyptiaca
MHC	Medinet Habu Calendar
MIO	Mitteilungen des Instituts für Orientforschung

MNL	Meroitic Newsletter
MonAeg	Monumenta aegyptiaca
NABU	Nouvelles assyriologiques brèves et utiles
NAWG	Nachrichten der Akademie der Wissenschaften in Göttingen
OLA	Orientalia Lovaniensia Analecta
OLP	Orientalia Lovaniensia Periodica
OLZ	Orientalistische Literatur-Zeitung
OMRO	Oudheidkundige mededelingen uit het Rijksmuseum van Oudheden te Leiden
OrAnt	Oriens Antiquus
PÄ	Probleme der Ägyptologie
PM	Porter & Moss, Topographical Bibliography
PPS	Proceedings of the Prehistoric Society
PSBA	Proceedings of the Society of Biblical Archaeology
QuF	Quellen und Forschungen zur Zeitbestimmung der ägyptischen Geschichte
RAD	Gardiner, Ramesside Administrative Documents
RCK	Dunham, Royal Cemeteries of Kush
RE	Pauly-Wissowa, Real-Encyclopädie der classischen Altertumswissenschaften
RlA	Reallexikon der Assyriologie
RT	Petrie, Royal Tombs
RdE	Revue d'Égyptologie
RecTrav	Recueil des travaux relatifs à la philologie et à l'archéologie égyptienne et assyriennes
Reliefs	The Bubastite Portal
REM	Repertoire d'Epigraphie Méroitique, J. Leclant, ed.
RITA	Kitchen, RITA
RSO	Rivista degli studi orientali
SAe	Studia Aegyptiaca
SAK	Studien zur altägyptischen Kultur
SARS	The Sudan Archaeological Research Society
SCCNH	Studies on the Civilization and Culture of Nuzi and the Hurrians
SCIEM	The Synchronisation of Civilizations in the Eastern Mediterranean in the Second Millennium B.C.
SIM	Serapeum Inventaire Mariette Louvre
SNR	Sudan Notes and Records
Studies Kakosy	Luft, ed., Studies Kakosy
TAVO	Tübinger Atlas des Vorderen Orients
TUAT	Texte aus der Umwelt des Alten Testaments
UGAÄ	Untersuchungen zur Geschichte und Altertumskunde Ägyptens
Urk.	Urkunden des ägyptischen Altertums
VA	Varia Aegyptiaca
WdO	Welt des Orients
WZKM	Wiener Zeitschrift für die Kunde des Morgenlandes
ZA	Zeitschrift für Assyriologie
ZÄS	Zeitschrift für Ägyptische Sprache und Altertumskunde
ZDPV	Zeitschrift des Deutschen Palästina-Vereins
ZPE	Zeitschrift für Papyrologie und Epigraphik

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